



**Center of Excellence for Advanced  
Materials Research,  
Published in ISI Journals**

**During 2012**

**December, 2012**





**IN THE NAME OF ALLAH  
THE MERCIFUL,  
THE MERCY-GIVING**



KINGDOM OF SAUDI ARABIA

Ministry of Higher Education

**KING ABDULAZIZ UNIVERSITY**

Center of Excellence for Advanced  
Materials Research



**Abstracts of Scientific Articles of the  
Center of Excellence for Advanced  
Materials Research,  
Published in ISI Journals  
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## **Preface**

Center of Excellence for Advanced Materials Research (CEAMR) at King Abdulaziz University, Jeddah, Saudi Arabia, has very significant recent developments in materials research, leading to a continuous growth in multidisciplinary publications. In fact, this expansion has been reflected on a large number of research articles published by CEAMR, placing the center to be the best among others.

It is a pleasure to present the first issue of scientific research articles of CEAMR published during 2012. All included articles have been indexed in highly reputable national and international databases.

Finally, I express my sincere gratitude and thanks to all local and international researchers and collaborators for their outstanding contribution to the scientific research publishing. Also, I thank all contributors who have produced this valuable document in a short span of time.

Sincerely,

**Professor Abdullah M. Asiri**

Director of CEAMR



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Center of Excellence for Advanced Materials Research

In 2012

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Abu-Zied, B.<sup>a b</sup>, Asiri, A.M.<sup>a</sup>

## **Urea-based combustion process for the synthesis of nanocrystalline Ni-La-Fe-O catalysts**

(2012) *Journal of Nanomaterials*, 2012, art. no. 428643, . Cited 1 time.

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### **Abstract**

Nanocrystalline Ni-La-Fe-O catalysts having the general formula  $\text{NiLa}_x\text{Fe}_{2-x}\text{O}_4$  ( $0.00 \leq x \leq 2.00$ ) were synthesized by the combustion route employing urea as a combustion fuel. The calcination process was affected at  $500^\circ\text{C}$ . The structural properties of the obtained catalysts were systematically investigated by X-ray powder diffraction (XRD), scanning electronic microscopy (SEM), energy-dispersive X-ray spectra (EDX), and nitrogen adsorption at  $-196^\circ\text{C}$ . Crystalline  $\text{NiFe}_2\text{O}_4$  and  $\text{La}_2\text{NiO}_4$  phases were detected for the catalysts having  $x = 0.00$  and  $2.00$ , respectively, as a result of solid-solid interaction between mixtures precursors. The activity of the obtained catalysts was checked for hydrogen peroxide decomposition at  $35\text{-}55^\circ\text{C}$ . A synergic effect was observed for the catalysts having  $x$ -value of  $1.00$  and  $1.50$ . Such effect was attributed to the increase in the number of the active constituents involved in the catalytic decomposition of  $\text{H}_2\text{O}_2$ . © 2012 Bahaa Abu-Zied and Abdullah M. Asiri.

**Document Type:** Article



Khan, S.B.<sup>a b</sup>, Rahman, M.M.<sup>a b</sup>, Akhtar, K.<sup>c</sup>, Asiri, A.M.<sup>a b</sup>, Alamry, K.A.<sup>b</sup>, Seo, J.<sup>d</sup>, Han, H.<sup>e</sup>

## Copper oxide based polymer nanohybrid for chemical sensor applications

(2012) *International Journal of Electrochemical Science*, 7 (11), pp. 10965-10975. Cited 5 times.

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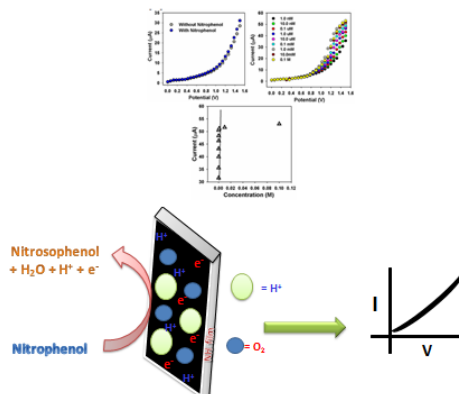
### Abstract

PCC based nanohybrid has been synthesized by simple intercalation of CuO nano-sheets into PPC matrix. The morphological and physicochemical structure of nanohybrid was characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), Energy dispersive spectroscopy (EDS), and Fourier transforms infrared spectroscopy. Interestingly, the morphology of CuO nano-sheets was changed into nanoparticles after intercalation into the polymer matrix. From application point of view, chemical sensing performance of PPC and nanohybrid was investigated by simple I-V technique using nitrophenol as an organic pollutant. By applying to nitrophenol sensing, both PPC and nanohybrid performed as best nitrophenol chemi-sensor in terms of sensitivity. Nanohybrid showed 11.25 times higher sensitivity ( $4.50 \mu\text{A}\cdot\text{cm}^{-2}\cdot\text{mM}^{-1}$ ) than pure PCC ( $0.40 \mu\text{A}\cdot\text{cm}^{-2}\cdot\text{mM}^{-1}$ ). Therefore, nanohybridization is an efficient route to improve sensing performance of PPC.

### Author Keywords

Chemical sensing; CuO nano-sheet; Nanohybrid; Nitrophenol; Organic pollutants; Poly propylene carbonate

Document Type: Article



Asiri, A.M.<sup>a</sup>, Arshad, M.N.<sup>a</sup>, Ishaq, M.<sup>b</sup>, Alamry, K.A.<sup>a</sup>, Shafiq, M.<sup>c</sup>

## 1-[(Z)-1-Ferrocenylethylidene]thiocarbohydrazide

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (12), pp. m1439.

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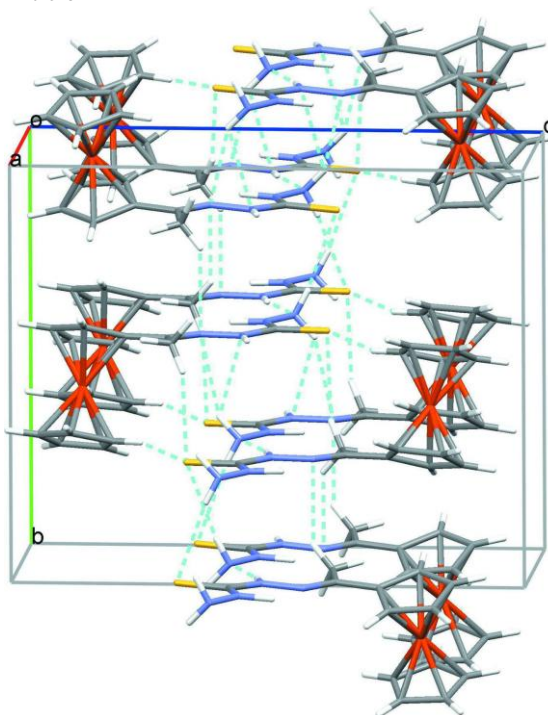
### Abstract

In the title compound, [Fe(C<sub>5</sub>H<sub>5</sub>)(C<sub>8</sub>H<sub>11</sub>N<sub>4</sub>S)], the cyclopentadienyl (Cp) rings of the ferrocene unit are close to being eclipsed. They are inclined to one another at an angle of 1.95 (2)° and lie 3.309 (2) Å away from each other. The ethylidenethiocarbohydrazide fragment is planar, with an r.m.s. deviation of 0.0347 (2) Å from the mean plane of its eight non-H atoms, and makes dihedral angles of 21.78 (1) and 19.97 (1)° with respect to the two Cp rings. The molecule adopts a trans geometry about the C=N double bond. In the crystal, N-H⋯(N/S) and C-H⋯S interactions stack the molecules in an inverse fashion along the b axis.

### Author Keywords

data-to-parameter ratio = 14.3; mean  $\omega(\text{C-C}) = 0.006$  Å; R factor = 0.053; single-crystal X-ray study; T = 296 K; wR factor = 0.155

**Document Type:** Article



Asiri, A.M.<sup>a,b</sup>, Arshad, M.N.<sup>b</sup>, Ishaq, M.<sup>a</sup>, Alamry, K.A.<sup>a,b</sup>, Bokhari, T.H.<sup>c</sup>

## Cis-Dichloridobis(N,N,N',N'-tetramethylethane-1,2-diamine) platinum(II)

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (12), pp. m1562.

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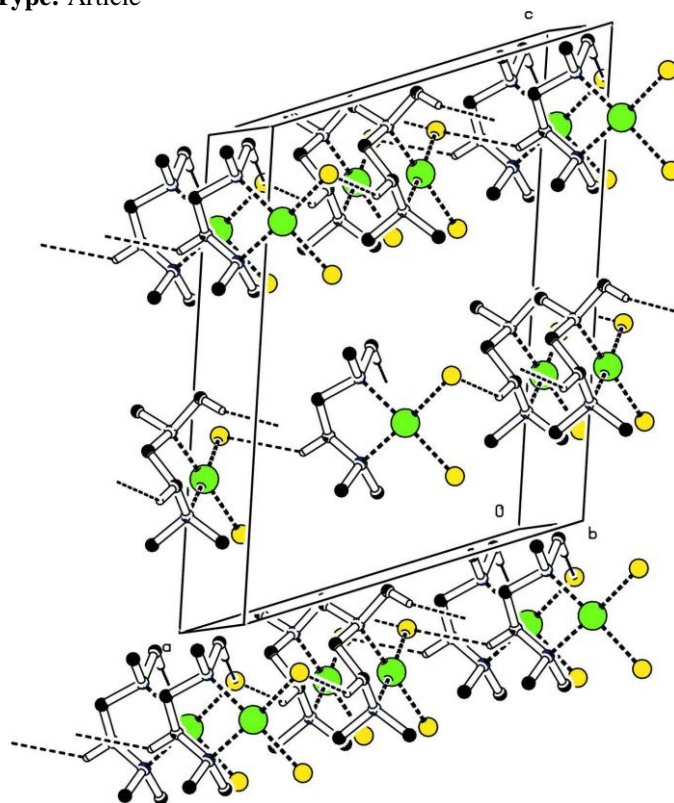
### Abstract

In the title complex, [PtCl<sub>2</sub>(C<sub>6</sub>H<sub>16</sub>N<sub>2</sub>)], the PtII atom adopts a distorted cis-PtN<sub>2</sub>Cl<sub>2</sub> square-planar coordination geometry. The five-membered chelate ring adopts a twisted conformation. In the crystal, weak C-H...Cl hydrogen bonds link the molecules into (001) sheets.

### Author Keywords

data-to-parameter ratio = 19.9; mean  $\omega(\text{C-C}) = 0.010 \text{ \AA}$ ; R factor = 0.044; single-crystal X-ray study; T = 296 K; wR factor = 0.116

**Document Type:** Article



Rahman, M.M.

## Development of mediator-free acetylcholine biosensor based on acetylcholine oxidase immobilized micro-chips

(2012) *Current Proteomics*, 9 (4), pp. 272-279. Cited 1 time.

Center of Excellence for Advanced Materials Research and Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

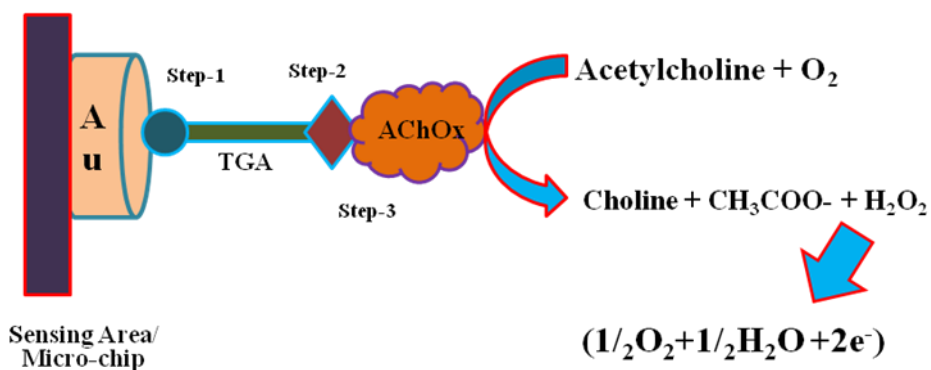
### Abstract

Acetylcholine (ACh) biosensor is developed based on mediator-free acetylcholine oxidase (AChOx) by self-assembled monolayer (SAM) onto lab-made micro-chip. The simple cyclic voltammetry (CV) method is utilized in mediator-free system in phosphate buffer solution (PBS, 0.1M) at room conditions. The analytical parameters of AChOx fabricated electrode employed a lower detection limit (DL, 0.136 nM), a wide linear dynamic range (LDR, 1.0 nM to 1.0 mM), good linearity ( $R= 0.9991$ ), and higher sensitivity ( $2.7329 \mu\text{AmM}^{-1}\text{cm}^{-2}$ ) where a tiny sample volume ( $70.0 \mu\text{L}$ ) is required. The micro-chip system executes a simple and efficient approach to immobilize the enzymes onto SAM modified surface, which can improve the biosensor performances for a large group of biomolecules in broad scale of biomedical applications in health-care fields. © 2012 Bentham Science Publishers.

### Author Keywords

Acetylcholine; Acetylcholine oxidase; Cyclic voltammetry; Detection limit; Immobilization; Linear dynamic range; Mediator-free system; Micro-chips; Phosphate buffer solution; Selectivity; Self-assembled monolayer; Sensitivity; Stability; Thio-glycolic acid

Document Type: Article



**Scheme:** Fabrication technique of ACh/AChOx sensor is prepared on micro-chip.

Asiri, A.M.<sup>a</sup>, Arshad, M.N.<sup>b</sup>, Zayed, M.E.M.<sup>c</sup>, Alamry, K.A.<sup>a</sup>, Shafiq, M.<sup>d</sup>

**Ethyl (Z)-2-chloro-2-[2-(4-methoxyphenyl)hydrazin-1-ylidene]acetate**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (12), pp. o3274. Cited 1 time.

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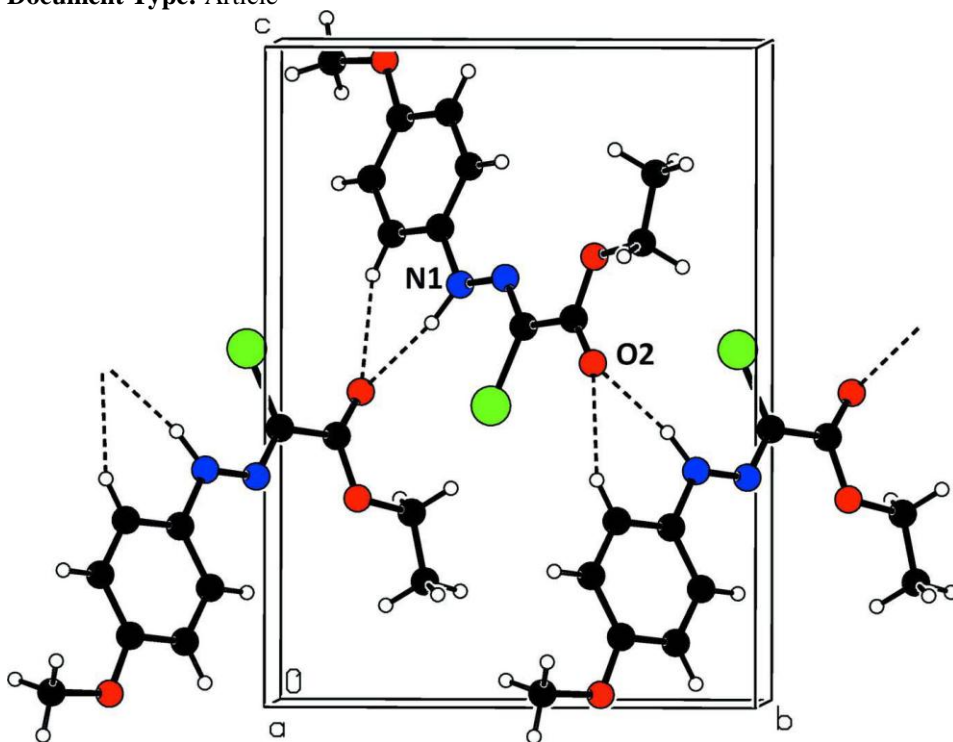
**Abstract**

The molecule of the title compound, C<sub>11</sub>H<sub>13</sub>ClN<sub>2</sub>O<sub>3</sub>, is planar (r.m.s. deviation = 0.0587 Å for non-H atoms) and adopts a Z conformation about the C=N double bond. In the crystal, molecules are linked via an N-H...O hydrogen bond, forming zigzag chains propagating along [010]. These chains are consolidated by C-H...O hydrogen bonds.

**Author Keywords**

data-to-parameter ratio = 11.5; mean  $\omega(\text{C-C}) = 0.004$  Å; R factor = 0.038; single-crystal X-ray study; T = 296 K; wR factor = 0.109

**Document Type:** Article



Irfan, A.<sup>a</sup>, Ijaz, F.<sup>b</sup>, Al-Sehemi, A.G.<sup>a,c</sup>, Asiri, A.M.<sup>d,e</sup>

## **Quantum chemical approach toward rational designing of highly efficient oxadiazole based oligomers used in organic field effect transistors**

(2012) *Journal of Computational Electronics*, 11 (4), pp. 374-384. Cited 2 times.

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### **Abstract**

Density functional theory (DFT) is well suited to explore the properties of the conjugated  $\pi$ -electron systems. We report the ground-state geometry optimization of newly designed oxadiazole based oligomers using the DFT method with B3LYP functional and 6-31G\*\* basis set. In addition, the relevant absorption spectra at the TD-B3LYP level are also discussed. The LUMO energies of systems 3-system 8 are smaller than the parent molecule (system 1) which revealed that these would be better electron transfer materials than parent molecule. The electrons transported by system 4, system 6, and system 7 would be stabilized against the environment. In addition, it can be seen from their plots of frontier MOs that there exist the conjugated delocalized  $\pi$ -electron systems in these derivatives and the involvement of electron withdrawing groups will increase their conjugated properties so that the absorption wavelengths are redshifted. The system 4-system 7 are showing the prominent red-shift of 33, 59, 28 nm, and 11 nm, respectively compared to system 1. © Springer Science+Business Media LLC 2012.

### **Author Keywords**

Absorption; Density of states; Highest occupied molecular orbitals; Lowest unoccupied molecular orbitals; Organic field effect transistors

**Document Type:** Article

Khedr, A.M.<sup>a</sup>, Marwani, H.M.<sup>b</sup>

**Synthesis, spectral, thermal analyses and molecular modeling of bioactive Cu(II)-complexes with 1,3,4-thiadiazole schiff base derivatives. Their catalytic effect on the cathodic reduction of oxygen**

(2012) *International Journal of Electrochemical Science*, 7 (10), pp. 10074-10093.

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**Abstract**

New mono-and binuclear copper(II) complexes with Schiff bases derived from the condensation of 2-amino-5-substituted-aryl-1,3,4-thiadiazole with substituted aryl aldehydes were synthesized. The complexes were characterized by elemental analyses, molar conductivity, magnetic moment, IR, <sup>1</sup>H NMR, electronic, ESR and mass spectrometry as well as thermal analyses. The conductivity data of the complexes confirmed their non-electrolytic nature. An octahedral geometry was suggested for complex 1, square-planar geometry proposed for complex 2 and square pyramidal structure suggested for complexes 3-7. The 3D molecular modeling of a representative complex was carried out on a CS Chem 3-D Ultra Molecular Modeling and Analysis Program. The synthesized complexes and ligands were screened in-vitro for their antimicrobial activity against gram-positive bacteria (*Staphylococcus aureus*), gram-negative bacteria (*Escherichia coli*) and fungi (*Aspergillus flavus* and *Candida albicans*). In most cases, metallation increased the antimicrobial activity compared with the free ligands. Also, the catalytic effect of the prepared complexes on the cathodic reduction of oxygen was studied. © 2012 by ESG.

**Author Keywords**

3D molecular modeling; Antimicrobial and catalytic activities; Copper(II) complexes; Thiadiazole schiff bases

**Document Type:** Article

Asiri, A.M.<sup>a,b</sup>, Arshad, M.N.<sup>b</sup>, Zayed, M.E.M.<sup>a</sup>, Alamry, K.A.<sup>a,b</sup>, Bokhari, T.H.<sup>c</sup>

**(Z)-Ethyl 2-chloro-2-[2-(4-methylphenyl)hydrazinylidene]acetate**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (12), pp. o3420.

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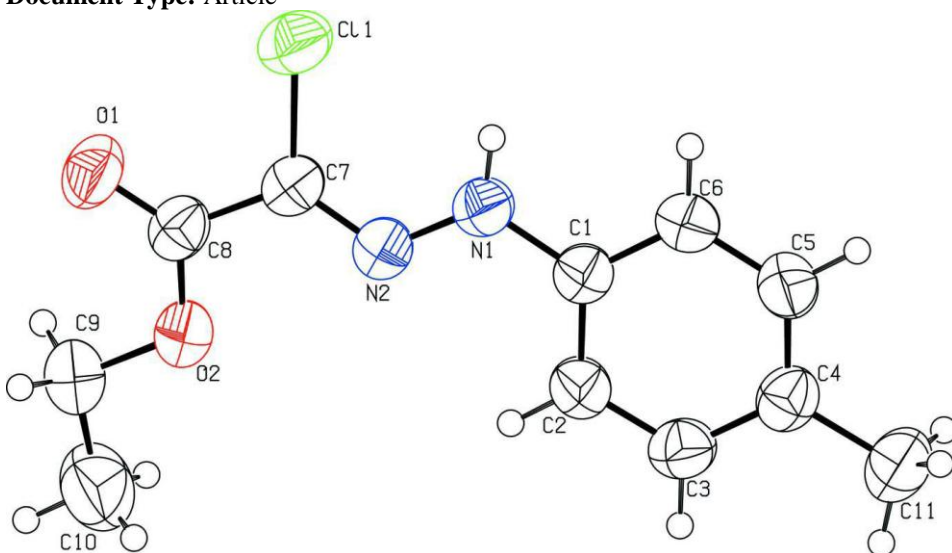
**Abstract**

The molecule of the title compound, C<sub>11</sub>H<sub>13</sub>ClN<sub>2</sub>O<sub>2</sub>, is approximately planar (r.m.s. deviation = 0.099 Å for non-H atoms) and adopts a Z conformation about the C=N double bond. In the crystal, molecules are linked by N-H···O and C-H···O hydrogen bonds to the same O-atom acceptor, forming zigzag chains propagating along [010]. These interactions give rise to R<sup>2</sup><sub>2</sub>1(6) loops.

**Author Keywords**

data-to-parameter ratio = 16.2; mean  $\omega(\text{C-C}) = 0.002$  Å; R factor = 0.040; single-crystal X-ray study; T = 296 K; wR factor = 0.113

**Document Type:** Article





Li, Q.<sup>a</sup>, Qin, X.<sup>a</sup>, Luo, Y.<sup>a</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **One-pot synthesis of Ag nanoparticles/reduced graphene oxide nanocomposites and their application for nonenzymatic H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Electrochimica Acta*, 83, pp. 283-287. Cited 4 times.

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### **Abstract**

In this paper, we report on one-pot synthesis of Ag nanoparticles/reduced graphene oxide (AgNPs/rGO) nanocomposites by heating mixed solution of graphene oxide (GO) and AgNO<sub>3</sub> with the use of diethylenetriamine as a reducing agent at 80 °C for 30 min. Several analytical techniques including UV-vis spectroscopy, Raman spectroscopy and transmission electron microscopy (TEM) have been employed to characterize the resulting nanocomposites. It was found that such nanocomposites exhibit good catalytic activity toward the reduction of H<sub>2</sub>O<sub>2</sub>. This nonenzymatic H<sub>2</sub>O<sub>2</sub> sensor shows a fast amperometric response time of less than 2 s. The linear detection range is estimated to be from 0.1 to 100 mM ( $r = 0.999$ ), and the detection limit is estimated to be 3.6 μM at a signal-to-noise ratio of 3. © 2012 Elsevier Ltd. All rights reserved.

### **Author Keywords**

Ag nanoparticles; H<sub>2</sub>O<sub>2</sub> detection; One-pot; Reduced graphene oxide

**Document Type:** Article

Jamal, A.<sup>a</sup>, Rahman, M.M.<sup>b c</sup>, Khan, S.B.<sup>b c</sup>, Faisal, M.<sup>a</sup>, Akhtar, K.<sup>d</sup>, Rub, M.A.<sup>b c</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>

## Cobalt doped antimony oxide nano-particles based chemical sensor and photo-catalyst for environmental pollutants

(2012) *Applied Surface Science*, 261, pp. 52-58. Cited 6 times.

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<sup>d</sup> Department of Chemistry, Ewha Womans University, Division of Nano Sciences, Seoul 120-750, South Korea

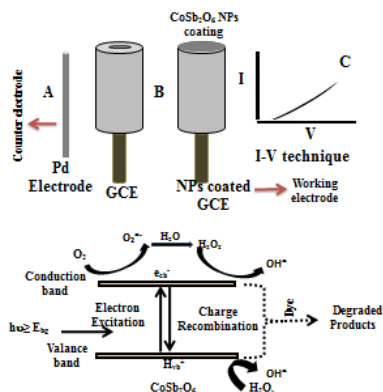
### Abstract

Cobalt doped antimony oxide nano-particles (NPs) have been synthesized by hydrothermal process and structurally characterized by utilizing X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM) and Fourier transforms infrared spectrophotometer (FT-IR) which revealed that the synthesized cobalt antimony oxides ( $\text{CoSb}_2\text{O}_6$ ) are well crystalline nano-particles with an average particles size of  $26 \pm 10$  nm. UV-visible absorption spectra ( $\sim 286$  nm) were used to investigate the optical properties of  $\text{CoSb}_2\text{O}_6$ . The chemical sensing of  $\text{CoSb}_2\text{O}_6$  NPs have been primarily investigated by I-V technique, where dichloromethane is used as a model compound. The analytical performance of dichloromethane chemical sensor exhibits high sensitivity ( $1.2432 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ) and a large linear dynamic range ( $1.0 \mu\text{M}$ - $0.01 \text{M}$ ) in short response time (10 s). The photo catalytic activity of the synthesized  $\text{CoSb}_2\text{O}_6$  nano-particles was evaluated by degradation of acridine orange (AO), which degraded 58.37% in 200 min. These results indicate that  $\text{CoSb}_2\text{O}_6$  nano-particles can play an excellent research impact in the environmental field.

### Author Keywords

Chemical sensing;  $\text{CoSb}_2\text{O}_6$  nano-particles; Optical properties; Photo-catalytic degradation; Structural properties

Document Type: Article



Asiri, A.M.<sup>a,b</sup>, Abo-Dya, N.E.<sup>c</sup>, Arshad, M.N.<sup>b</sup>, Alamry, K.A.<sup>a,b</sup>, Shafiq, M.<sup>d</sup>  
**1-(1H-1,2,3-Benzotriazol-1-yl)-2-(4-methoxyphenyl)ethanone**  
(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (11), pp. o3221.

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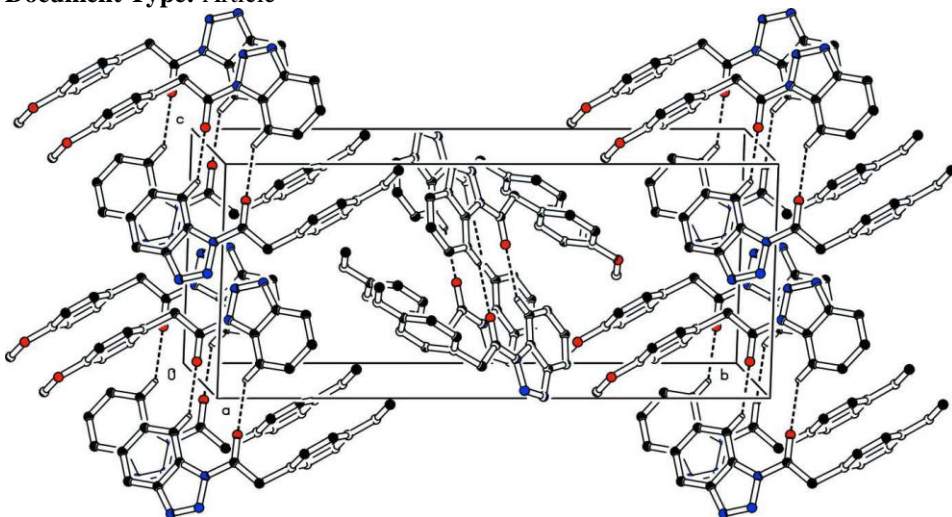
### Abstract

In the title compound, C<sub>15</sub>H<sub>13</sub>N<sub>3</sub>O<sub>2</sub>, the dihedral angle between the benzotriazole ring system (r.m.s. deviation = 0.0124 Å) and the benzene ring is 76.21(3)°. The methoxy C atom deviates from its benzene ring plane by 0.063(2) Å. In the crystal, inversion dimers linked by pairs of C-H...O hydrogen bonds generate R<sup>2</sup><sub>2</sub>(12) loops.

### Author Keywords

data-to-parameter ratio = 14.9; mean(C-C) = 0.002 Å; R factor = 0.039; single-crystal X-ray study; T = 296 K; wR factor = 0.109

**Document Type:** Article



Asiri, A.M.<sup>a, b</sup>, Abo-Dya, N.E.<sup>c</sup>, Arshad, M.N.<sup>b</sup>, Shafiq, M.<sup>d</sup>

## 1-(Benzotriazol-1-yl)-2-bromoethanone

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (11), pp. o3179.

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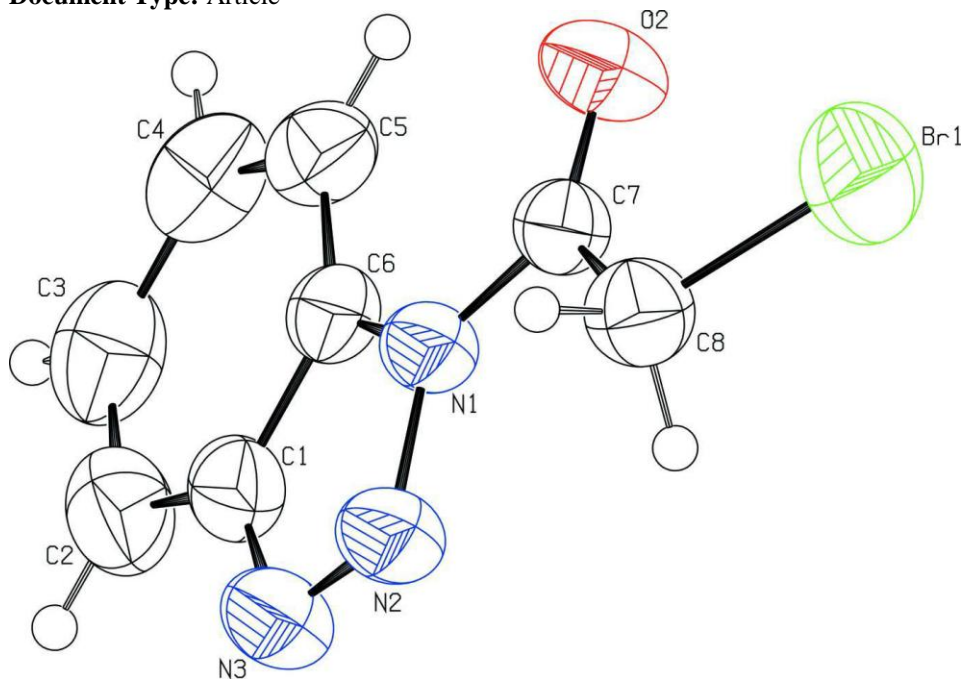
### Abstract

In the title compound C<sub>8</sub>H<sub>6</sub>BrN<sub>3</sub>O, the benzotriazole ring is essentially planar (r.m.s. deviation = 0.0034 Å) and the bromoacetyl unit is twisted at a dihedral angle of 15.24(16)° with respect to it. In the crystal, pairs of C-H...O hydrogen bondings result in the formation of inversion dimers, forming R 2 2(12) rings, which are connected by further C-H...O interactions into chains extending along the b-axis direction.

### Author Keywords

data-to-parameter ratio = 15.5; mean(C-C) = 0.004 Å; R factor = 0.044; single-crystal X-ray study; T = 296 K; wR factor = 0.141

**Document Type:** Article



Khan, S.B.<sup>a,b</sup>, Akhtar, K.<sup>c</sup>, Rahman, M.M.<sup>a,b</sup>, Asiri, A.M.<sup>a,b</sup>, Seo, J.<sup>d</sup>, Alamry, K.A.<sup>b</sup>, Han, H.<sup>e</sup>

## A thermally and mechanically stable eco-friendly nanocomposite for chemical sensor applications

(2012) *New Journal of Chemistry*, 36 (11), pp. 2368-2375. Cited 7 times.

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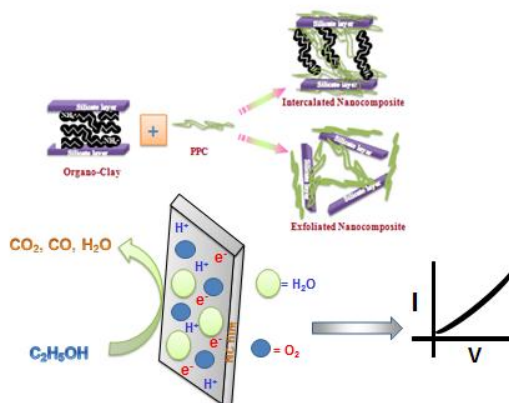
<sup>d</sup> Department of Packaging, Yonsei University, Wonju-si, Kangwondo 220-710, South Korea

<sup>e</sup> Department of Chemical and Biomolecular Engineering, Yonsei University, 262 Seongsanno, Seodaemun-gu, Seoul 120-749, South Korea

### Abstract

Ethanol chemical sensors have been developed by proficient exploitation of polypropylene carbonate (PPC) and PPC/cloisite 20B (clay) nanocomposite (NC) for the detection and quantification of ethanol in the environment. NC was synthesized by the addition of polypropylene carbonate (PPC) into 5 wt% of cloisite 20B. The physicochemical structure was characterized by X-ray diffraction (XRD) and Fourier transform infrared spectroscopy. The thermal and mechanical properties of PPC and NC were investigated by thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC), and nanoindentation analyzer, respectively. NC displayed high thermal and mechanical properties. TGA results revealed that the thermal decomposition temperature ( $T_{d50\%}$ ) of PPC increased significantly, being 43 °C higher than that of pure PPC, while DSC measurements indicated that NC increased the glass transition temperature from 21 to 32 °C. Accordingly, NC showed a high elastic modulus and hardness as compared to PPC. By applying to ethanol sensing, both PPC and NC performed as the best ethanol chemi-sensors in terms of sensitivity. NC showed 3.24 times higher sensitivity ( $0.8231 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ) as compared to pure PCC ( $0.2543 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ).

**Document Type:** Article



Rub, M.A.<sup>a</sup>, Asiri, A.M.<sup>a b</sup>, Kumar, D.<sup>c</sup>, Khan, A.<sup>a</sup>, Khan, A.A.P.<sup>a</sup>, Azum, N.<sup>a</sup>, Kabir-Ud-Din<sup>c</sup>

## Effect of organic additives on the phase separation phenomenon of amphiphilic drug solutions

(2012) *Journal of Surfactants and Detergents*, 15 (6), pp. 765-775. Cited 2 times.

<sup>a</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

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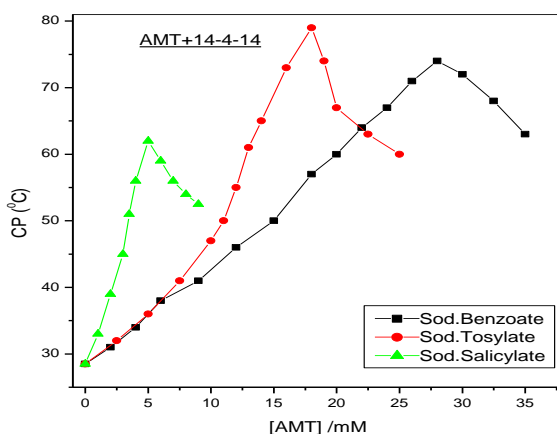
### Abstract

The effect of various organic additives, viz. sugars, ureas, alcohols, hydrotropes and bile salts on the clouding (phase separation) phenomenon of the amphiphilic antidepressant drug amitriptyline hydrochloride was investigated in the present study. All sugars lowered the cloud point (CP) due to their water structure-making property. Urea and alkylureas were found to lower the CP. In contrast, thioureas increased the CP slightly, but the presence of methyl group(s) had a similar effect in alkylureas. Short chain alcohols affected the CP insignificantly while higher ones decreased it, and medium chain alcohols showed peak behavior. Addition of hydrotropes and bile salts increased the CP at lower concentrations, while a decrease was observed at higher concentrations (like the medium chain alcohols). In addition, thermodynamic parameters were also evaluated but only for those additives which formed mixed micelles with the drug. © AOCS 2012.

### Author Keywords

Alcohols; Amitriptyline hydrochloride; Amphiphilic antidepressant drug; Bile salts; Cloud point; Hydrotropes

Document Type: Article



Effect of addition of hydrotropes on the cloud point of 50 mM AMT prepared in 2.5 mM CTAB + 10 mM sodium phosphate buffer (pH = 6.7).

Tian, J.<sup>a b</sup>, Li, H.<sup>a</sup>, Xing, Z.<sup>a</sup>, Wang, L.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**One-pot green hydrothermal synthesis of CuO-Cu<sub>2</sub>O-Cu nanorod-decorated reduced graphene oxide composites and their application in photocurrent generation**

(2012) *Catalysis Science and Technology*, 2 (11), pp. 2227-2230. Cited 3 times.

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<sup>b</sup> Graduate School of the Chinese Academy of Sciences, Beijing 100039, China

<sup>c</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia

<sup>d</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

**Abstract**

In this communication, we develop a facile one-pot green strategy toward CuO-Cu<sub>2</sub>O-Cu nanorod-decorated reduced graphene oxide (CuNRs-rGO) composites by hydrothermal heating of the mixed solution of GO and Cu(OAc)<sub>2</sub> under basic conditions without the use of extra reducing agents. As-synthesized composites have been successfully applied in photocurrent generation in the visible spectral region. This journal is © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Khan, S.A.<sup>a</sup>, Asiri, A.M.<sup>a b</sup>

**Synthesis and in vitro antibacterial activity of novel steroidal (6R)-spiro-1,3,4-thiadiazoline derivatives**

(2012) *Journal of Heterocyclic Chemistry*, 49 (6), pp. 1452-1457. Cited 1 time.

<sup>a</sup> Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah 21589, Saudi Arabia

<sup>b</sup> Center of Excellence for Advanced Materials Research, King Abdul Aziz University, Jeddah 21589, Saudi Arabia

**Abstract**

Novel steroidal (6R)-spiro-1,3,4-thiadiazoline derivatives were synthesized by the cyclization of steroidal thiosemicarbazones with acetic anhydride, screened in vitro against antibacterial activity using disc-diffusion method and the minimum inhibitory concentration. The results showed that steroidal thiadiazoline derivatives exhibited better antibacterial activity than the steroidal thiosemicarbazone derivatives. Chloro and acetoxy substituents on the 3 $\beta$ -position of the steroidal thiadiazoline ring increased the antibacterial activity. Among all the compounds, compound 7 and 8 were found better inhibitors of both types of bacteria (Gram-positive and Gram-negative) as compared to the respective drug amoxicillin. All the synthesized compounds were well characterized by spectroscopic methods such as IR, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR mass, and elemental analysis and their stereochemistry was also discussed. © 2012 HeteroCorporation.

**Document Type:** Article



Lee, M.<sup>a</sup>, Khan, S.B.<sup>b</sup>, Seo, K.<sup>a</sup>, Lee, J.-W.<sup>a</sup>, Akhtar, K.<sup>c</sup>, Han, H.<sup>a</sup>, Asiri, A.M.<sup>b</sup>  
**Synthesis, characterization and fuel cell application of polyimides**  
 (2012) *Letters in Organic Chemistry*, 9 (9), pp. 655-659. Cited 1 time.

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<sup>b</sup> Center of Excellence for Advanced Materials Research (CEAMR) and Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

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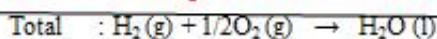
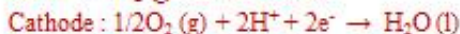
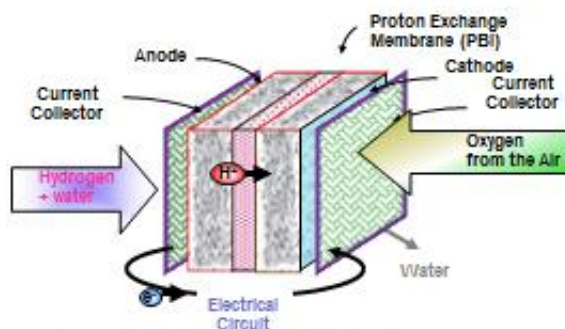
### Abstract

Proton conducting polyimides containing pendant benzimidazole groups have been synthesized by different ratios of 5-(1H-benzimidazol-2-yl)-benzene-1,3-diamine (DABI) and oxydianiline (ODA) in the presence of oxydianiline (ODPA). All the polymers were structurally characterized by Fourier transform infrared (FT-IR) spectroscopy while the thermal properties were studied by thermal gravimetric analysis (TGA) and differential scanning calorimetry (DSC). From application point of view, proton conductivity of all polymers doped with phosphoric acid was studied by impedance analyzer. All the polymers have been found to be thermally stable with high dielectric constants and are proton conductive. The polymer with highest DABI value showed highest conductivity (max 0.11 S/cm). © 2012 Bentham Science Publishers.

### Author Keywords

Dielectrics; Polymers; Proton conductivity; Thermal properties

Document Type: Article



Asiri, A.M.<sup>a b</sup>, Khan, S.A.<sup>a</sup>

**Synthesis, characterization, and in vitro antibacterial activities of macromolecules derived from bis-chalcone**

(2012) *Journal of Heterocyclic Chemistry*, 49 (6), pp. 1434-1438. Cited 1 time.

<sup>a</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

<sup>b</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah, Saudi Arabia

**Abstract**

We investigated the antibacterial activity of some new macromolecules such as bis-pyrazoline, bis-pyrazole, bis-pyrimidines prepared from the reaction of bis-chalcone with thiosemicarbazide/phenyl hydrazine/guanidine hydrochloride/thiourea. All the macromolecules have been characterized by IR, <sup>1</sup>H NMR, <sup>13</sup>C NMR, mass and elemental analyses. The antibacterial activity of these compounds was first tested in vitro by the disc diffusion assay against two Gram-positive and two Gram-negative bacteria, and then the minimum inhibitory concentration was determined with the reference to standard drug chloramphenicol. The results showed that pyrazoline derivative showed better antibacterial activity on *S. typhimurium* and *E. coli* than the reference drug chloramphenicol. © 2012 HeteroCorporation.

**Document Type:** Article

Azum, N.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Akram, M.<sup>c</sup>

## Effect of Neutral Polymer on Critical Micelle Concentration of Cationic Gemini Surfactants in Aqueous Solutions

(2012) *Journal of Dispersion Science and Technology*, 33 (10), pp. 1509-1513.

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<sup>b</sup> Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

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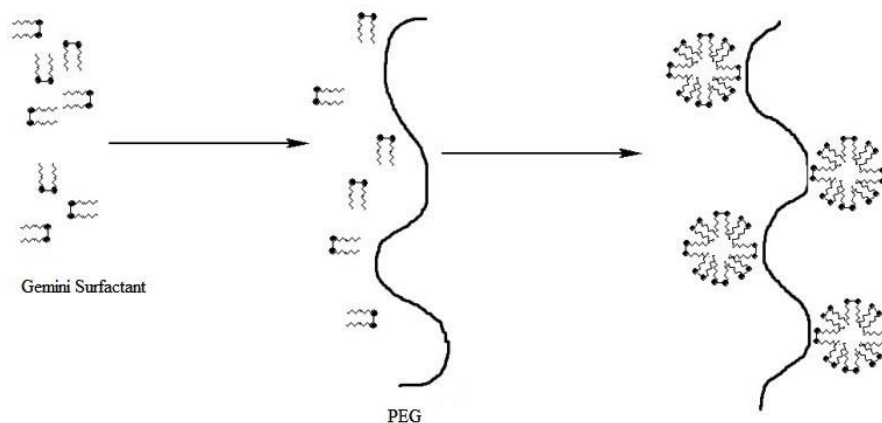
### Abstract

The interaction between three PEGs (polyethylene glycol) and gemini surfactants in aqueous solution has been studied using conductometry. The surfactants studied were dicationic dibromide gemini surfactants with different methylene spacer length, 16-s-16, where  $s = 4$  to 6 methylene groups. The critical aggregation concentration (CAC), and critical micelle concentration concentration (CMC) were derived from conductometric titration curves. The thermodynamic parameters were evaluated where  $\Delta G_{mic}$ ,  $\Delta G_{agg}$ , and  $\Delta G_{trans}$  are found to be negative, confirming the feasibility of interaction. © 2012 Copyright Taylor and Francis Group, LLC.

### Author Keywords

Critical aggregation concentration; critical micelle concentration; gemini surfactant; polyethylene glycol

Document Type: Article



Arshad, M.N.<sup>a</sup>, Danish, M.<sup>b</sup>, Tahir, M.N.<sup>c</sup>, Khalid, S.<sup>b</sup>, Asiri, A.M.<sup>a,d</sup>

## Ethyl 2-benzenesulfonamido-4-methyl-pentanoate

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (10), pp. o2874.

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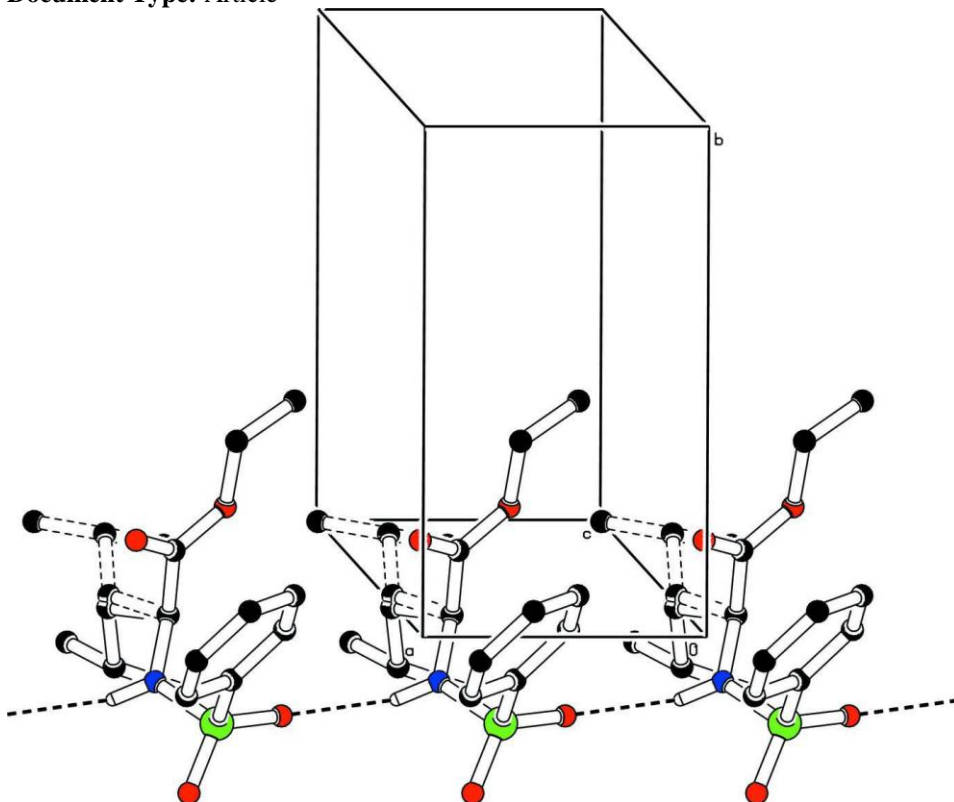
<sup>c</sup> Department of Physics, University of Sargodha, Sargodha, Pakistan

<sup>d</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, PO Box 80203, Jeddah 21589, Saudi Arabia

### Abstract

In the title compound, C<sub>14</sub>H<sub>21</sub>NO<sub>4</sub>S, the O - S - O angle is 120.06 (11)°, with the S atom adopting a distorted tetrahedral geometry. In the crystal, N - H...O hydrogen bonds connect the molecules along the a axis, generating an infinite chain. The disordered C atoms of the isobutyl group were refined with the C - C distances restrained to 1.52 (1) Å and the occupancy ratio refined to 0.504 (3):0.496 (3).

**Document Type:** Article



Chu, Q.<sup>a</sup>, Du, J.<sup>b</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Xing, Z.<sup>a</sup>, Li, H.<sup>a</sup>, Ge, C.<sup>a</sup>, Wang, L.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Synthesis of a MnO<sub>2</sub> nanosheet/graphene flake composite and its application as a supercapacitor having high rate capability**

(2012) *ChemPlusChem*, 77 (10), pp. 872-876. Cited 1 time.

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**Abstract**

Hydrothermal treatment of KMnO<sub>4</sub> and graphene flakes (GFs) leads to MnO<sub>2</sub> nanosheets decorated on GFs. The resulting MnO<sub>2</sub>/GF (MG) composite has been tested as a supercapacitor electrode in aqueous electrolyte and found to exhibit good cycling stability with a specific capacitance of 147 Fg<sup>-1</sup> at a current density of 5 Ag<sup>-1</sup> (see figure). © 2012 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

**Author Keywords**

Composites; Graphene; Hydrothermal synthesis; Manganese dioxide; Supercapacitors

**Document Type:** Article

Qin, X.<sup>a</sup>, Luo, Y.<sup>a</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **One-step synthesis of Ag nanoparticles-decorated reduced graphene oxide and their application for H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Electrochimica Acta*, 79, pp. 46-51. Cited 5 times.

<sup>a</sup> China West Normal University, School of Chemistry and Chemical Industry, Chemical Synthesis and Pollution, Control Key Laboratory of Sichuan Province, 1 Shida Road, Nanchong 637002, China

<sup>b</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia

<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

### **Abstract**

Ag nanoparticles-decorated reduced graphene oxide (AgNPs-rGO) has been successfully fabricated through a one-step strategy, carried out by hydrothermal treatment of the mixture of AgNO<sub>3</sub> and GO solution under strong alkaline conditions at 180 °C for 30 min. The reaction was accomplished without extra reducing agent and surface modifier. As-synthesized AgNPs-rGO has been successfully applied in catalytic performance toward the reduction of H<sub>2</sub>O<sub>2</sub>. This H<sub>2</sub>O<sub>2</sub> sensor shows a wide linear range of 0.1- 60 mM ( $r = 0.991$ ) and a low detection limit of 1.80 μM at a signal-to-noise ratio of 3. © 2012 Elsevier Ltd.

### **Author Keywords**

Ag nanoparticles; H<sub>2</sub>O<sub>2</sub> detection; One-step; Reduced graphene oxide

**Document Type:** Article

Siddiqui, S.A.<sup>a</sup>, Rasheed, T.<sup>b</sup>, Faisal, M.<sup>a</sup>, Pandey, A.K.<sup>c</sup>, Khan, S.B.<sup>d</sup>

## Electronic structure, nonlinear optical properties, and vibrational analysis of gemifloxacin by density functional theory

(2012) *Spectroscopy (New York)*, 27 (3), pp. 185-206.

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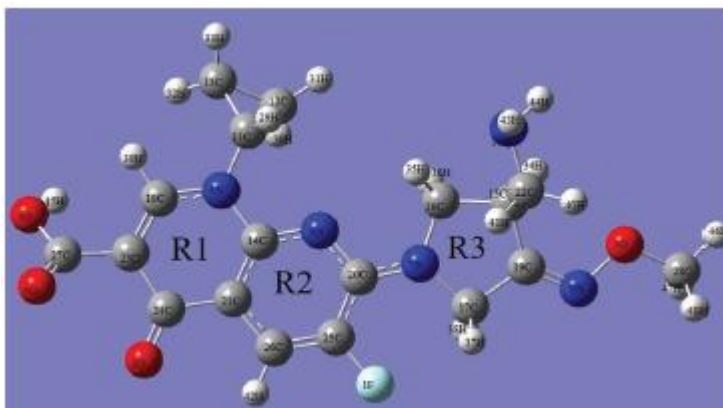
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<sup>d</sup> Center of Excellence for Advanced Materials Research and Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

### Abstract

The non-linear optical properties of gemifloxacin (CN have been examined using density functional theory (DFT). The molecular HOMO, LUMO composition, their respective energy gaps, MESP contours/surfaces have also been drawn to explain the activity of gemifloxacin. The equilibrium geometries and harmonic frequencies of title molecule was determined and analyzed at DFT/B3LYP level employing the 6-31G(d,p) basis set. The skeleton of both the optimized molecules is non-planar. In general, a good agreement between experimental and calculated normal modes of vibrations has been observed. © 2012 Shamooun Ahmad Siddiqui et al.

**Document Type:** Article



Rahman, M.M.<sup>a,b</sup>, Khan, S.B.<sup>a,b</sup>, Faisal, M.<sup>c</sup>, Rub, M.A.<sup>a,b</sup>, Al-Youbi, A.O.<sup>b</sup>, Asiri, A.M.<sup>a,b</sup>

## Electrochemical determination of olmesartan medoxomil using hydrothermally prepared nanoparticles composed SnO<sub>2</sub>-Co<sub>3</sub>O<sub>4</sub> nanocubes in tablet dosage forms

(2012) *Talanta*, 99, pp. 924-931. Cited 11 times.

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<sup>c</sup> Department of Chemistry, Advanced Materials and Nano Research Centre, Najran University, P.O. Box 1988, Najran, 11001, Saudi Arabia

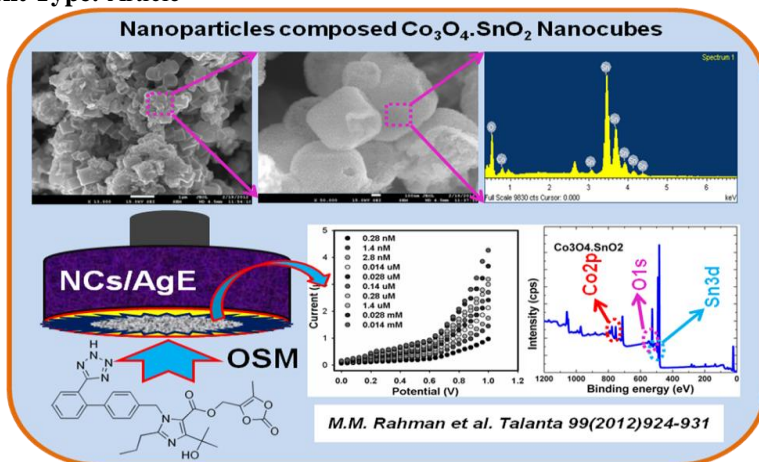
### Abstract

Low-dimensional nanoparticles composed SnO<sub>2</sub>-Co<sub>3</sub>O<sub>4</sub> nanocubes (NCs) were prepared by a hydrothermal method using reducing agents. The doped nanomaterials were investigated by UV/vis, powder X-ray diffraction, FT-IR, energy-dispersive X-ray spectroscopy (EDS), and Raman spectroscopy, and field-emission scanning electron microscopy. They were deposited on a silver electrode (AgE, surface area, 0.0216 cm<sup>2</sup>) to give a drug sensor with a fast response towards Olmesartan medoxomil (OSM) in 0.1 mol L<sup>-1</sup> phosphate buffer-phases. The sensor also exhibits higher sensitivity, long-term stability, and enhanced electrochemical response. The calibration plot is linear ( $r^2=0.9948$ ) over the 0.28 nmol L<sup>-1</sup>-1.4  $\mu$ M OSM concentration range. The sensitivity is  $\sim 2.083 \mu$ A cm<sup>-2</sup> mmol L<sup>-1</sup> and the detection limit is 0.17 nmol L<sup>-1</sup> (at an SNR of 3). We discuss the possible potential uses of this nanoparticles doped semiconductor NCs in terms of drug sensing, which could also be employed for the determination of drugs in quality control of formulation. © 2012 Elsevier B.V.

### Author Keywords

Hydrothermal method; I-V technique; Olmesartan medoxomil; Optical properties; Sensitivity; SnO<sub>2</sub>-Co<sub>3</sub>O<sub>4</sub> nanocubes

Document Type: Article





Zhang, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Li, H.<sup>a</sup>, Wang, L.<sup>a</sup>, Qin, X.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Biomolecule-assisted, environmentally friendly, one-pot synthesis of CuS/reduced graphene oxide nanocomposites with enhanced photocatalytic performance**

(2012) *Langmuir*, 28 (35), pp. 12893-12900. Cited 10 times.

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<sup>b</sup> Graduate School of the Chinese Academy of Sciences, Beijing 100039, China

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**Abstract**

In this work, we develop a novel environmentally friendly strategy toward one-pot synthesis of CuS nanoparticle-decorated reduced graphene oxide (CuS/rGO) nanocomposites with the use of l-cysteine, an amino acid, as a reducing agent, sulfur donor, and linker to anchor CuS nanoparticles onto the surface of rGO sheets. Upon visible light illumination ( $\lambda > 400$  nm), the CuS/rGO nanocomposites show pronounced enhanced photocurrent response and improved photocatalytic activity in the degradation of methylene blue (MB) compared to pure CuS. This could be attributed to the efficient charge transport of rGO sheets and hence reduced recombination rate of excited carriers.  
© 2012 American Chemical Society.

**Document Type:** Article

Arshad, M.N.<sup>a</sup>, Danish, M.<sup>b</sup>, Tahir, M.N.<sup>c</sup>, Aabideen, Z.U.<sup>b</sup>, Asiri, A.M.<sup>a,d</sup>

## 2-Benzenesulfonamido-3-methylbutyric acid

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (9), pp. o2665. Cited 2 times.

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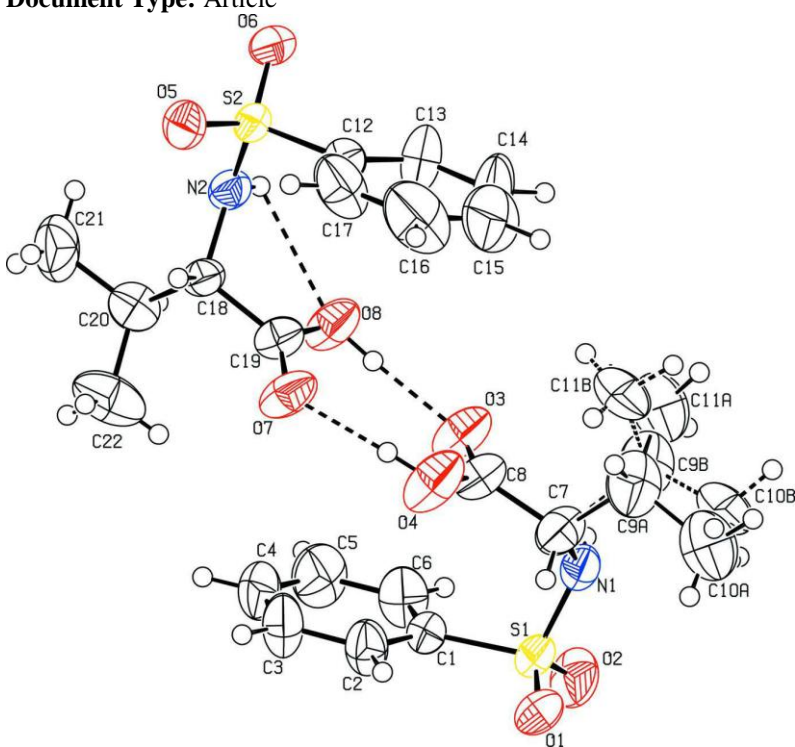
<sup>c</sup> Department of Physics, University of Sargodha, Sargodha, Pakistan

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### Abstract

In the crystal structure of the title compound, C<sub>11</sub>H<sub>15</sub>NO<sub>4</sub>S, two independent molecules are present per asymmetric unit; they are dimerized through O - H...O hydrogen bonds between their carb-oxy groups to generate R<sub>2</sub> 2(8) loops. An intramolecular N - H...O link in one of the molecules closes an S(5) ring. The dimers are linked by N - H...O and C - H...O hydrogen bonds to form a three-dimensional network. The C atoms of the isopropyl group of one of the molecules are disordered over two orientations in a 3:1 ratio.

**Document Type:** Article



Khan, S.B.<sup>a,b</sup>, Akhtar, K.<sup>c</sup>, Seo, J.<sup>d</sup>, Han, H.<sup>e</sup>, Ru, M.A.<sup>a,b</sup>

**Effect of nano-filler dispersion on the thermal, mechanical and water sorption properties of green environmental polymer**

(2012) *Chinese Journal of Polymer Science (English Edition)*, 30 (5), pp. 735-743. Cited 4 times.

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<sup>e</sup> Department of Chemical and Biomolecular Engineering, Yonsei University, 262 Seongsanno, Seodaemun-gu, Seoul 120-749, South Korea

**Abstract**

Partially exfoliated nanocomposite (2) has been synthesized by intercalation of poly(propylene carbonate) (PPC) into commercial clay, Cloisite 20B (PPC/C-20B). Nanocomposite 2 was characterized physico-chemically and exhibited high thermal, mechanical and anti-water sorption properties as compared to PPC and intercalated nanocomposite (1) of PPC/C- 20B having same amount of clay. TGA results revealed that the thermal decomposition temperature ( $T_d$ , 50%) of 2 increased significantly, being 40 K and 17 K higher than that of pure PPC and 1, respectively, while DSC measurements indicated that the nano-filler dispersion of 2 increased the glass transition temperature from 21°C to 31°C. Accordingly, 2 showed high elastic modulus, hardness and anti-water absorption capacity. These thermal, mechanical and anti-water absorption improvements are of great importance for the application of PPC as packaging and biomaterials. © 2012 Chinese Chemical Society Institute of Chemistry, CAS Springer-Verlag Berlin Heidelberg.

**Author Keywords**

Cloisite 20B; Mechanical property; Nanocomposite; Poly(propylene carbonate); Solution intercalation; Thermal property; Water absorption property

**Document Type:** Article

Imran Khan, M.<sup>a</sup>, Kim, H.Y.<sup>a</sup>, Nam, T.-H.<sup>b</sup>, Miyazaki, S.<sup>a b c</sup>

## **Formation of nanoscaled precipitates and their effects on the high-temperature shape-memory characteristics of a Ti 50Ni 15Pd 25Cu 10 alloy**

(2012) *Acta Materialia*, 60 (16), pp. 5900-5913. Cited 2 times.

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<sup>b</sup> School of Materials Science and Engineering and ERI, Gyeongsang National University, 900 Gazwadong, Jinju, Gyeongnam 660-701, South Korea

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### **Abstract**

The effects of thermomechanical treatment on the microstructure and high-temperature shape-memory characteristics of a TiNiPdCu alloy were investigated. An unexpected precipitation behavior was identified in a Ti 50Ni 15Pd 25Cu 10 alloy. Very high densities of nanoscale precipitates of TiPdCu and Ti 2Pd types were found to be formed in the thermomechanically treated Ti 50Ni 15Pd 25Cu 10 alloy. A spinodal type of decomposition process was expected to be the cause of the observed precipitation behavior. It was noticed that the preferential diffusion of Cu atoms towards the heterogeneous nucleation sites promoted the precipitation of TiPdCu-type precipitates, which in turn promoted the precipitation of fine Ti 2Pd-type precipitates. These precipitates greatly increased the resistance against the transformation-induced plasticity and creep deformation, especially at high stresses and high temperatures, mainly because of the high-temperature stability of these precipitates. High densities of these nanoscaled precipitates caused an anomalous increase in hardness and retarded the martensitic transformation. It was expected that the current research results could be highly beneficial for the development of high-temperature shape-memory alloys stable at temperatures  $\geq 773$  K, while keeping the benefits of ease of fabrication. © 2012 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.

### **Author Keywords**

Cold deformation; High-temperature shape-memory alloys; Precipitation strengthening; Thermomechanical treatment; TiNiPd

**Document Type:** Article

Marwani, H.M.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Khan, S.A.<sup>a</sup>

## **Green-synthesis, characterization, photostability and polarity studies of novel Schiff base dyes using spectroscopic methods**

(2012) *Russian Journal of Bioorganic Chemistry*, 38 (5), pp. 533-538. Cited 1 time.

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### **Abstract**

Preparation, characterization, photostability and polarity studies of novel Schiff base dyes using spectroscopic methods were achieved. The Schiff base dyes were prepared by the reaction of salicylaldehyde/2-hydroxy-1-naphthaldehyde with aminophenazone under microwave irradiation. The spectroscopic (FT-IR, <sup>1</sup>H NMR, <sup>13</sup>C NMR, Mass) studies and elemental analyses were in good agreement with chemical structure of synthesized compounds. In addition, UV-Vis and fluorescence spectroscopic experiments showed that these dyes are good absorbent and fluorescent. Based on the photostability study of these dyes, minimal to no loss in fluorescence intensities of 4-[(2-hydroxy-benzylidene)-amino]1,5-dimethyl-2-phenyl-1,2-dihydro-pyrazol-3-one (D1) (6.14%) and 4-[(2-hydroxy-naphthalen-1-ylmethylene)-amino]-1,5-dimethyl-2-phenyl-1,2-dihydro-pyrazol-3-one (D2) (2.95%) was observed with an increase in the exposure time using time-based fluorescence steady-state experiments. These studies also inferred that these Schiff base dyes have a high photostability against photobleaching. In addition, Dye 2 is found to be more sensitive than Dye 1 to the polarity of the microenvironment provided by different solvents based on the results of fluorescence polarity studies. © Pleiades Publishing, Ltd., 2012.

### **Author Keywords**

Florescent; Photostability; Pyrazol-3-one; Schiff bases

**Document Type:** Article

Irfan, A.<sup>a</sup>, Hina, N.<sup>b</sup>, Al-Sehemi, A.G.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>

## **Quantum chemical investigations aimed at modeling highly efficient zinc porphyrin dye sensitized solar cells**

(2012) *Journal of Molecular Modeling*, 18 (9), pp. 4199-4207. Cited 5 times.

<sup>a</sup> Chemistry Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia

<sup>b</sup> Institute of Chemistry, University of the Punjab, Lahore 54590, Pakistan

<sup>c</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

<sup>d</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

### **Abstract**

Zinc tetraphenylporphyrin (ZnTPP) was modified by a push-pull strategy and then density functional theory (DFT) and time-dependent DFT (TD-DFT) calculations were performed for the resulting derivatives. The smallest HOMO-LUMO energy gaps were found in ZnTPP-6 and ZnTPP-7, which had nitro substituents and a conjugated chain, while the largest was observed for ZnTPP-5. The energy gaps of all of the systems designed in this work were smaller than that of ZnTPP. Clear intramolecular charge transfer was observed from donor to acceptor in ZnTPP-6 and ZnTPP-7, which had nitro groups at positions R8, R9, and R10, as well as in ZnTPP-3 and ZnTPP-4, which had cyano groups at those positions. The narrow band gaps (compared to that of ZnTPP) of these designed systems, where the LUMO is above the conduction band of TiO<sub>2</sub> and the HOMO is below the redox couple, indicate that they are efficient sensitizers. The B bands of these newly designed derivatives, except for ZnTPP-5, are redshifted compared with the B band of ZnTPP. © Springer-Verlag 2012.

### **Author Keywords**

Absorption; Density functional theory; Dye-sensitized solar cell; Frontier molecular orbitals; Porphyrin

**Document Type:** Article

Hussein, M.A.<sup>a b</sup>, Abdel-Rahman, M.A.<sup>b</sup>, Asiri, A.M.<sup>a c</sup>, Alamry, K.A.<sup>a</sup>, Aly, K.I.<sup>b</sup>

**Review on: Liquid crystalline Polyazomethines polymers. Basics, syntheses and characterization**

(2012) *Designed Monomers and Polymers*, 15 (5), pp. 431-463. Cited 4 times.

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<sup>b</sup> Chemistry Department, Polymer Chemistry Lab. 122, Assiut University, P.O. Box 71516, Assiut, Egypt

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**Abstract**

Liquid crystalline behavior of polymeric materials is of considerable current interest in the last decades, but due to many different and distinct characteristics. Polyazomethines liquid crystalline polymers have received considerable attention due to their potential applications and considered as one of the most important liquid crystalline material produced. This review gives a simple introduction to liquid crystalline materials including definition and classification. Moreover, we will focus on the syntheses and properties of liquid crystalline polyazomethines with flexible spacers or hybrid liquid crystalline polyazomethines. Furthermore, give a general overview of thermotropic, mesophoric properties and texture observation for desired liquid crystalline polyazomethines were shown in details. © 2012 Taylor & Francis.

**Author Keywords**

Characterization; Liquid crystalline polymers; Mesophoric; Polyazomethines; Synthesis; Thermotropic

**Document Type:** Review

Asiri, A.M.<sup>a b</sup>, El-Daly, S.A.<sup>a c</sup>, Khan, S.A.<sup>a</sup>

## **Spectral characteristics of 4-(p-N,N-dimethyl-aminophenylmethylene)-2- phenyl-5-oxazolone (DPO) in different media**

(2012) *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 95, pp. 679-684. Cited 1 time.

<sup>a</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

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<sup>c</sup> Department of Chemistry, Faculty of Science, Tanta University, 31527 Tanta, Egypt

### **Abstract**

The absorption and fluorescence characteristics of 4-(p-N,N-dimethyl-aminophenylmethylene)-2-phenyl-5-oxazolone (DPO) have been investigated in different solvents. DPO dye exhibits a large red shift in both absorption and emission spectra as solvent polarity increases, indicating a large change in the dipole moment of dye molecules upon excitation due to an intramolecular charge transfer interaction. The fluorescence quantum yield depends strongly on the properties of the solvents. Crystalline solids of DPO gave strong red emission at 605 nm due to the excitation of molecular aggregates. The absorption and fluorescence emission spectral properties of DPO have also been investigated in organized media of aqueous micellar and  $\beta$ -cyclodextrin ( $\beta$ -CD) solutions. The critical micelle concentrations (CMCs) of SDS and CTAB as well as the binding constants of DPO in micellar solution and  $\beta$ -cyclodextrin have been also determined. © 2012 Elsevier B.V. All rights reserved.

### **Author Keywords**

4-(p-N,N-dimethyl-aminophenylmethylene)-2-phenyl-5-oxazolone; Effect of solvents; Fluorescence quantum yield; Hydrogen bonding; Micellization

**Document Type:** Article



Chang, G.<sup>a</sup>, Luo, Y.<sup>a</sup>, Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **Synthesis of Pt nanoparticles decorated 1,5-diaminoanthraquinone nanofibers and their application toward catalytic reduction of 4-nitrophenol**

(2012) *Journal of Nanoscience and Nanotechnology*, 12 (9), pp. 7075-7080. Cited 3 times.

<sup>a</sup> Chemical Synthesis and Pollution Control Key Laboratory of Sichuan Province, School of Chemistry and Chemical Industry, China West Normal University, Nanchong 637002, Sichuan, China

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<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

### **Abstract**

The present communication reports on the rapid preparation of 1,5-diaminoanthraquinone nanofibers (DAAQNFs) on a large scale by a reprecipitation method and their subsequent decoration with small platinum nanoparticles (PtNPs) using tannic acid (TA) as a reducing agent. It suggests the resultant PtNP/DAAQNF composites exhibit a good catalytic activity toward reduction of 4-nitrophenol (4-NP) to 4-aminophenol (4-AP) by NaBH<sub>4</sub>. It also suggests that the composites exhibit higher catalytic activity than the PtNPs due to that the DAAQNF support may play an active part in the catalysis, yielding a synergistic effect. The possible mechanism involved has also been discussed. Copyright © 2012 American Scientific Publishers All rights reserved.

### **Author Keywords**

1-5-Diaminoanthraquinone nanofiber; 4-Nitrophenol; Pt nanoparticles; Synergistic effect

**Document Type:** Article

Fujioka, Y.<sup>a</sup>, Frantti, J.<sup>a</sup>, Asiri, A.M.<sup>b</sup>, Obaid, A.Y.<sup>b</sup>, Jiang, H.<sup>a</sup>, Nieminen, R.M.<sup>a</sup>

## **Structural properties of pure and nickel-modified nanocrystalline tungsten trioxide**

(2012) *Journal of Physical Chemistry C*, 116 (32), pp. 17029-17039. Cited 2 times.

<sup>a</sup> Department of Applied Physics, Aalto University School of Science, FI-00076 Aalto, Finland

<sup>b</sup> Chemistry Department, Center of Excellence for Advanced Materials Research, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

### **Abstract**

The particle size and nickel-doping effect on pure nanocrystalline WO<sub>3</sub> powders are addressed through X-ray diffraction, Raman spectroscopy, and transmission electron microscopy. A brief review of different structure types of tungsten oxides is also given. Stable and metastable crystallographic structures, resulting from oxygen deficiency, metal doping, or low-temperature synthesis, are discussed. The focus is put on the topology of the structures and notably on the structural features allowing ion intercalation. Small particle size WO<sub>3</sub> powders were synthesized by two different wet chemical methods to determine the impact of particle size on the crystal symmetry: in the first method, a freeze-drying technique was utilized, whereas the second technique was based on a reverse micelle method. Both methods yielded similar powders with an average size of approximately 10 nm. However, the first method yielded single-phase rhenium oxide structured particles, whereas the latter method produced a mixture of hexagonal tungsten bronze and rhenium oxide structures. In the case of single-phase rhenium oxide structure powders, the crystal symmetry was found to increase from monoclinic P2<sub>1</sub>/n to orthorhombic Pbcn when particle size decreased below 20 nm. The effect of nickel doping (≈1 wt %) and synthesis conditions on WO<sub>3</sub> powders were studied. Ni-doped WO<sub>3</sub> was spatially inhomogeneous: the most abundant phase was monoclinic WO<sub>3</sub>, whereas the minority phase was either perovskite tungsten bronze (annealing temperature below 500 °C) or wolframite (annealing temperature 500 °C or higher) showing that annealing conditions are a way to selectively produce different crystal structures. The wolframite and tungsten bronze structures are very different with different applications. The results are discussed in the context of thin film synthesis and sensor applications. © 2012 American Chemical Society.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

## **2-[1-(1-Oxoindan-2-yl)eth-yl]indan-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (8), pp. o2314.

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<sup>c</sup> Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

### **Abstract**

In the title compound, C<sub>20</sub>H<sub>18</sub>O<sub>2</sub>, the fused-ring systems are essentially planar (r.m.s. deviations of the nine fitted atoms = 0.009 and 0.027 Å) and exhibit an orthogonal relationship [dihedral angle = 79.83 (5)°]. To a first approximation, the ketone-O atoms are directed to opposite sides of the molecule. A three-dimensional architecture arises in the crystal packing owing to C-H...O, C-H...π and π-π interactions [between centrosymmetrically related benzene rings with centroid-centroid distance = 3.7647 (10) Å].

### **Author Keywords**

data-to-parameter ratio = 16.6; mean  $\sigma$ (C-C) = 0.002 Å; R factor = 0.048; single-crystal X-ray study; T = 100 K; wR factor = 0.130

**Document Type:** Article

Mughal, S.Y.<sup>a</sup>, Khan, I.U.<sup>a</sup>, Harrison, W.T.A.<sup>b</sup>, Khan, M.H.<sup>c</sup>, Arshad, M.N.<sup>d</sup>

## 2,5-Dichloro-N-(3-methyl-phen-yl)benzenesulfonamide

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (8), pp. o2476. Cited 1 time.

<sup>a</sup> Materials Chemistry Laboratory, Department of Chemistry, GC University, Lahore 54000, Pakistan

<sup>b</sup> Department of Chemistry, University of Aberdeen, Meston Walk, Aberdeen AB24 3UE, United Kingdom

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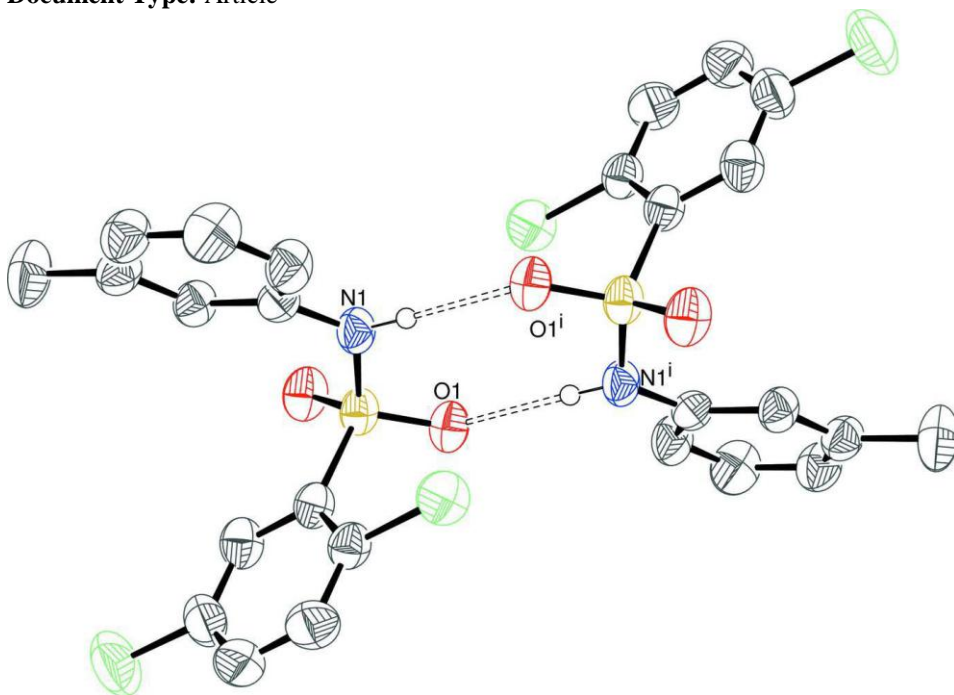
### Abstract

In the title compound, C<sub>13</sub>H<sub>11</sub>Cl<sub>2</sub>NO<sub>2</sub>S, the dihedral angle between the aromatic rings is 76.62 (10)° and the C-S-N-C linkage between the rings adopts a gauche conformation [torsion angle = -51.4 (2)°]. A weak intra-molecular C-H...O interaction closes an S(6) ring. In the crystal, inversion dimers linked by pairs of N-H...O hydrogen bonds generate R<sub>2</sub>2(8) loops.

### Author Keywords

data-to-parameter ratio = 14.8; mean  $\sigma$ (C-C) = 0.005 Å; R factor = 0.052; single-crystal X-ray study; T = 296 K; wR factor = 0.159

**Document Type:** Article



Asiri, A.M.<sup>a,b</sup>, Faidallah, H.M.<sup>b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-(4-Bromo-phen-yl)-8-methyl-2-oxo-1,2,3,4,4a,5,6,7-octa-hydro-quinoline-3- carbonitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (8), pp. o2376-o2377.

<sup>a</sup> Center of Excellence for Advanced Materials Research (CEAMR), King Abdulaziz University, PO Box 80203, Jeddah 21589, Saudi Arabia

<sup>b</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, PO Box 80203, Jeddah 21589, Saudi Arabia

<sup>c</sup> Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

**Abstract**

In the title compound, C<sub>17</sub>H<sub>17</sub>BrN<sub>2</sub>O, the N-containing ring adopts an envelope conformation with the C atom carrying the phenyl ring displaced by 0.531 (9) Å from the plane defined by the remaining five atoms (r.m.s. deviation = 0.0099 Å). The benzene ring is almost orthogonal to the ring to which it is attached, the CCN-C-CPh-CPh torsion angle being -101.3 (7)°. The cyclo-hexene ring is disordered over two conformations in a statistical ratio. The most prominent inter-actions in the crystal are pairs of N-H...O hydrogen bonds between inversion-related mol-ecules. The resulting dimers are linked into a three-dimensional architecture by C-H...N, C-H...Br and C-H...π inter-actions.

**Author Keywords**

data-to-parameter ratio = 17.8; disorder in main residue; mean  $\sigma(\text{C-C}) = 0.008 \text{ \AA}$ ; R factor = 0.063; single-crystal X-ray study; T = 100 K; wR factor = 0.173

**Document Type:** Article

Arshad, M.N.<sup>a</sup>, Danish, M.<sup>b</sup>, Tahir, M.N.<sup>c</sup>, Khalid, S.<sup>b</sup>, Asiri, A.M.<sup>a,d</sup>

### 4-Methyl-2-(2-nitro-benzene-sulfon-amido)-penta-noic acid

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (8), pp. o2573. Cited 2 times.

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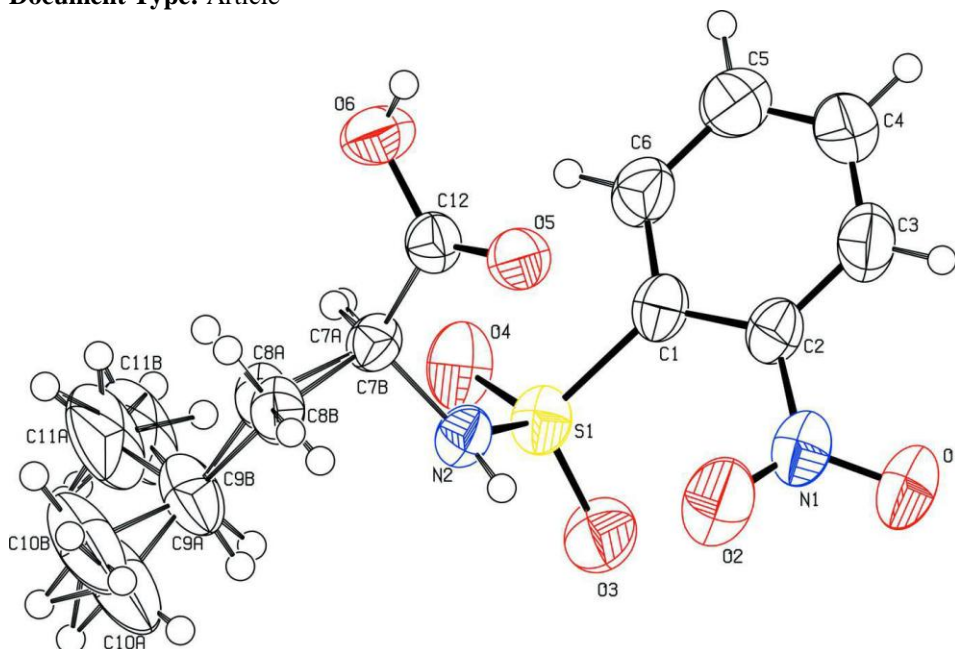
#### Abstract

In the title compound, C<sub>12</sub>H<sub>16</sub>N<sub>2</sub>O<sub>6</sub>S, the S atom adopts a distorted tetra-hedral geometry with an O-S-O angle of 119.76 (13)°. The nitro group is twisted by 35.34 (2)° with respect to the aromatic ring; it accepts an N-H···O hydrogen bond, resulting in a S(7) motif. In the crystal, N-H···O and O-H···O hydrogen bonds connect the molecules into an infinite chain along the a axis. The methyl C atoms of the isopropyl group are disordered in a 1:1 ratio.

#### Author Keywords

data-to-parameter ratio = 12.9; disorder in main residue; mean  $\sigma(\text{C-C}) = 0.005 \text{ \AA}$ ; R factor = 0.043; single-crystal X-ray study; T = 296 K; wR factor = 0.090

Document Type: Article



Irfan, A.<sup>a</sup>, Al-Sehemi, A.G.<sup>a</sup>, Asiri, A.M.<sup>b,c</sup>

**Donor-enhanced bridge effect on the electronic properties of triphenylamine based dyes: Density functional theory investigations**

(2012) *Journal of Molecular Modeling*, 18 (8), pp. 3609-3615. Cited 4 times.

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**Abstract**

The geometries have been optimized by using density functional theory. The highest occupied molecular orbitals are delocalized on triphenylamine moiety while lowest unoccupied molecular orbital are localized on anchoring group. Intramolecular charge transfer has been observed from highest occupied molecular orbitals to lowest unoccupied molecular orbital. By replacing the vinyl hydrogens with methoxy as well as one benzene ring as bridge leads to a raised energy gap while extending the bridge decreases the energy gap compared to parent molecule. The HOMO energies bump up by extending the bridge. The LUMO energies of all the investigated dyes are above the conduction band of TiO<sub>2</sub> and HOMOs are below the redox couple except 3c. The distortion between anchoring group and triphenylamine can hamper the recombination reaction. © Springer-Verlag 2012.

**Author Keywords**

Density functional theory; Dye sensitized solar cell; HOMO; LUMO

**Document Type:** Article

Rahman, M.M.<sup>a,b</sup>, Khan, S.B.<sup>a,b</sup>, Faisal, M.<sup>c</sup>, Asiri, A.M.<sup>a,b</sup>, Alamry, K.A.<sup>b</sup>

## Highly sensitive formaldehyde chemical sensor based on hydrothermally prepared spinel ZnFe<sub>2</sub>O<sub>4</sub> nanorods

(2012) *Sensors and Actuators, B: Chemical*, 171-172, pp. 932-937. Cited 12 times.

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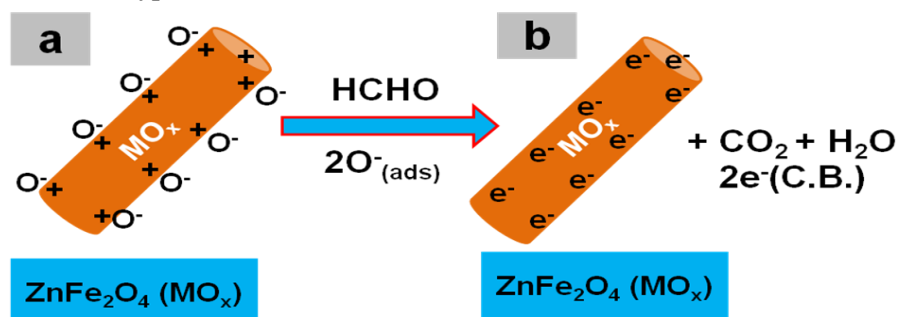
### Abstract

A considerable effort has been made for the growth and development of face-centered-cubic spinel zinc ferrite (ZnFe<sub>2</sub>O<sub>4</sub>) nanorods using hydrothermal method at room conditions. The structural, optical and chemical properties of ZnFe<sub>2</sub>O<sub>4</sub> nanorods were characterized using various methods such as UV/visible, Fourier transform infrared spectroscopy, Raman spectroscopy, powder X-ray diffraction, and field-emission scanning electron microscopy etc. Spinel ZnFe<sub>2</sub>O<sub>4</sub> is an attractive nanorods for potential application in chemical sensing by easy and reliable I-V method, where formaldehyde is considered as a model compound. The chemical sensor performances are exhibited the higher sensitivity, good stability, and repeatability of the sensor enhanced significantly using spinel ZnFe<sub>2</sub>O<sub>4</sub> nanorods of thin-film with conducting binders on silver electrodes (AgE). The calibration plot is linear over the large dynamic range, where the sensitivity ( $\sim 4.10 \pm 0.05 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ) and detection limit ( $\sim 0.0089 \mu\text{M}$ ) were calculated based on signal/noise ratio ( $\sim 3N/S$ ) in short response time. Finally, it is concluded that the structural and optical characteristics could be encompassed to a broad-scale in spinel ZnFe<sub>2</sub>O<sub>4</sub> nanorods and efficient chemical sensor applications for environmental and healthcare fields. © 2012 Elsevier B.V. All rights reserved.

### Author Keywords

Formaldehyde chemi-sensors; Hydrothermal method; I-V technique; Sensitivity; Spinel ZnFe<sub>2</sub>O<sub>4</sub> nanorods

Document Type: Article





Mughal, S.Y.<sup>a</sup>, Khan, I.U.<sup>a</sup>, Harrison, W.T.A.<sup>b</sup>, Khan, M.H.<sup>c</sup>, Arshad, M.N.<sup>d</sup>

## N-(2,3-Dihydro-1,4-benzodioxin-6-yl)-4-fluoro-benzene-sulfonamide

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (8), pp. o2433. Cited 3 times.

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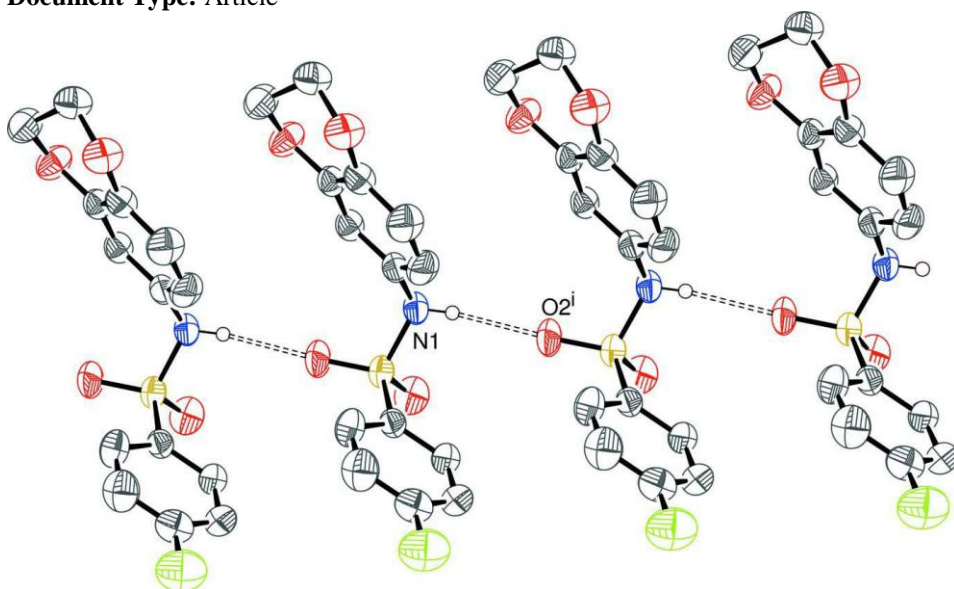
### Abstract

In the title compound, C<sub>14</sub>H<sub>12</sub>FNO<sub>4</sub>S, the dihedral angle between the aromatic rings is 50.26 (9)° and the C-S-N-C bond adopts a gauche conformation [torsion angle = -68.12 (15)°]. The dihydro-dioxine ring is disordered over two orientations, which both approximate to half-chairs, in a 0.880 (7):0.120 (7) ratio. In the crystal, N-H···O hydrogen bonds link the molecules into C(4) chains propagating in [100]. Weak C-H···O and C-H···F inter-actions consolidate the packing.

### Author Keywords

data-to-parameter ratio = 15.6; disorder in main residue; mean  $\sigma(\text{C-C}) = 0.003 \text{ \AA}$ ; R factor = 0.037; single-crystal X-ray study; T = 296 K; wR factor = 0.101

### Document Type: Article



Khan, S.A.<sup>a</sup>, Asiri, A.M.<sup>a b</sup>

**Novel steroidal (6R)-spiro-1,3,4-thiadiazoline derivatives as anti-bacterial agents**

(2012) *Chinese Journal of Chemistry*, 30 (8), pp. 1901-1905.

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**Abstract**

Novel steroidal (6R)-spiro-1,3,4-thiadiazoline derivatives have been synthesized by the cyclization of steroidal thiosemicarbazones. Thiosemicarbazones have been synthesized by the reaction of steroidal ketones with thiosemicarbazide. All the compounds have been characterized by IR, <sup>1</sup>H NMR, mass and elemental analyses. The antibacterial activities of these compounds have been first tested in vitro by the disk diffusion assay against two Gram-positive and two Gram-negative bacteria, and then the minimum inhibitory concentration (MIC) values have been determined with the reference of standard drug amoxicillin. The results showed that steroidal thiadiazoline derivatives exhibited better antibacterial activity than the steroidal thiosemicarbazone derivatives. Chloro and acetoxy substituents on the 3 $\beta$ -position of the steroidal thiadiazoline ring increased the anti-bacterial activity. Among all the compounds, compounds 7 and 8 were found better inhibitors as compared to the respective drug amoxicillin. © 2012 SIOC, CAS, Shanghai & WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

**Author Keywords**

amoxicillin; antibacterial activity; cholesterol; steroidal thiadiazolines; steroidal thiosemicarbazones

**Document Type:** Article

Rub, M.A.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Sheikh, M.S.<sup>c</sup>, Khan, A.<sup>a b</sup>, Khan, A.A.P.<sup>a b</sup>, Azum, N.<sup>a b</sup>, Kabir-Ud-Din<sup>c</sup>

## Organic additives and pharmaceutical excipients as cloud point modifiers in amitriptyline hydrochloride solutions

(2012) *Journal of Molecular Liquids*, 172, pp. 59-65. Cited 2 times.

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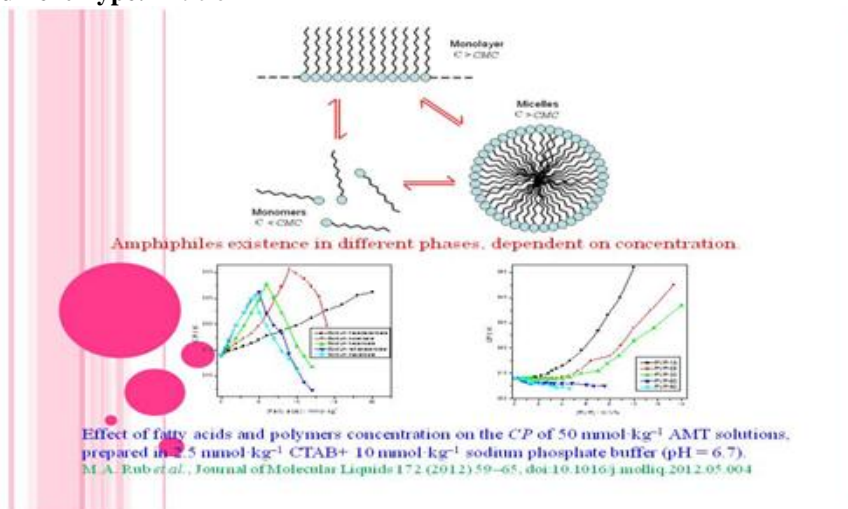
### Abstract

The phase behavior of cationic amphiphilic drug amitriptyline hydrochloride (AMT) under the influence of surfactants, polymers, cyclodextrin and fatty acids has been investigated. These additives are generally used in pharmaceutical industry as excipients for drug delivery systems. The degree of CP variation by different additives is different depending upon the type and structure of additive. Cationic (conventional/gemini) surfactants depict continuous increase whereas anionic surfactants show a maximum at a particular concentration. Polymer behavior in drug solution is prescribed by the number of monomer units present in a peculiar polymer.  $\beta$ -cyclodextrin acts as a simple sugar therefore a decrease in CP of the drug solutions is observed. Fatty acid behavior is similar to anionic surfactants i.e. shows maximum at fixed concentration for particular types of fatty acid. The cloud point (CP) of AMT falls with an increase in pH because of deprotonation of the drug molecules. The thermodynamic parameters are evaluated: whereas  $\delta G^{\circ}$  is found to be negative, and depending upon the type and nature of additive  $\delta H^{\circ}$  and  $T\delta S^{\circ}$  values are negative as well as positive. © 2012 Elsevier B.V. All rights reserved.

### Author Keywords

$\beta$ -Cyclodextrin; Amitriptyline hydrochloride; Amphiphilic antidepressant drug; Cloud point; Fatty acids

Document Type: Article



Liu, S.<sup>a</sup>, Qin, X.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Sun, X.<sup>a c d</sup>

**Photochemical preparation of fluorescent 2,3-diaminophenazine nanoparticles for sensitive and selective detection of Hg(II) ions**

(2012) *Sensors and Actuators, B: Chemical*, 171-172, pp. 886-890.

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**Abstract**

In this paper, we report on a simple, green strategy for the production of fluorescent 2,3-diaminophenazine (DAP) nanoparticles (NPs) by UV light irradiation of o-phenylenediamine (oPD) aqueous solution at room temperature for the first time. We further demonstrate the proof of concept that the DAP NPs can be used as a very effective fluorescent sensing platform for sensitive and selective detection of Hg(II) ions with a detection limit as low as 1 nM. © 2012 Elsevier B.V. All rights reserved.

**Author Keywords**

2,3-Diaminophenazine; Fluorescence; Photochemistry; Sensitive and selective Hg(II) ion

**Document Type:** Article

Li, H.<sup>a</sup>, Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Lu, W.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Ternary Nanocomposites of Porphyrin, Angular Au Nanoparticles and Reduced Graphene Oxide: Photocatalytic Synthesis and Enhanced Photocurrent Generation**

(2012) *ChemCatChem*, 4 (8), pp. 1079-1083. Cited 3 times.

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<sup>b</sup> Graduate School of the Chinese Academy of Sciences, Beijing 100039, China

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**Author Keywords**

Gold; Graphene; Nanoparticles; Photocatalytic; Surface plasmon resonance

**Document Type:** Article

Rahman, M.M.<sup>a b</sup>, Khan, S.B.<sup>a b</sup>, Faisal, M.<sup>c</sup>, Asiri, A.M.<sup>a b</sup>, Tariq, M.A.<sup>d</sup>

## Detection of aprepitant drug based on low-dimensional un-doped iron oxide nanoparticles prepared by a solution method

(2012) *Electrochimica Acta*, 75, pp. 164-170. Cited 11 times.

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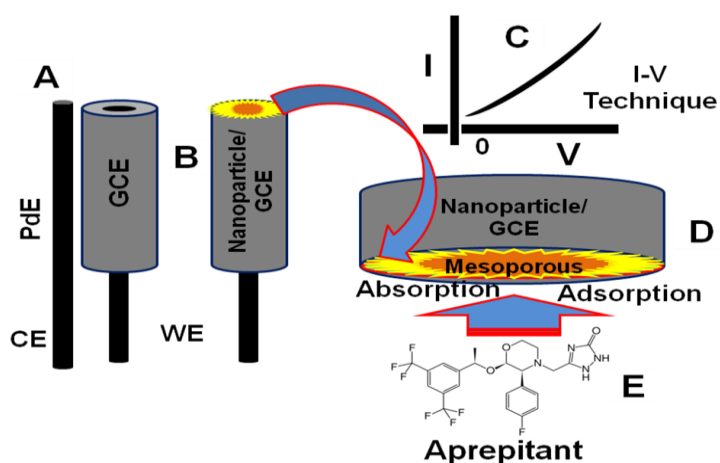
### Abstract

We have prepared as-grown iron oxide nanoparticle by a solution method using reducing agents (urea and NH<sub>4</sub>OH) in alkaline phase. The nanoparticles were characterized by UV/vis, FT-IR, and Raman spectroscopy, powder X-ray diffraction, and field-emission scanning electron microscopy. They were deposited on a glassy carbon electrode (GCE, surface area, 0.0316 cm<sup>2</sup>) to give a sensor with a fast response towards Aprepitant (APPT) drug in buffer phase. The sensor also exhibits good sensitivity and long-term stability as well as enhanced electrochemical response. The calibration plot is linear ( $r^2 = 0.9703$ ) over the 2.2 nM to 4.1 μM APPT concentration range. The sensitivity is  $\sim 2.5316 \pm 0.5 \mu\text{A cm}^{-2} \text{mM}^{-1}$ , and the detection limit is  $0.38 \pm 0.02 \text{ nM}$  (at a signal-to-noise-ratio of 3) in short response time (10 s). This method could also be employed for the determination of drugs in quality control of formulation using a reliable I-V method. © 2012 Elsevier Ltd. All rights reserved.

### Author Keywords

Aprepitant drug; I-V technique; Iron oxide nanoparticles; Optical properties; Sensitivity; Solution method

Document Type: Article



Chang, G.<sup>a</sup>, Hu, J.<sup>b</sup>, Lu, W.<sup>a</sup>, Qin, X.<sup>a</sup>, Asiri, A.M.<sup>c,d</sup>, Al-Youbi, A.O.<sup>c,d</sup>, Sun, X.<sup>a,c,d</sup>

## **Carbon nanocapsules as an effective sensing platform for fluorescence-enhanced nucleic acid detection**

(2012) *Journal of Nanoscience and Nanotechnology*, 12 (5), pp. 3775-3780. Cited 1 time.

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<sup>d</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

### **Abstract**

In this communication, we demonstrate the proof of concept that carbon nanocapsules (CNCs) can be used as an effective fluorescent sensing platform for nucleic acid detection with selectivity down to single-base mismatch. The detection is accomplished by two steps: (1) CNC adsorbs and quenches the fluorescence of the dye-labeled single-stranded DNA (ssDNA) probe; (2) in the presence of the target, a hybridization event occurs, which produces a double-stranded DNA (dsDNA) that detaches from the CNC surface, leading to recovery of the dye fluorescence. Copyright © 2012 American Scientific Publishers. All rights reserved.

### **Author Keywords**

Carbon Nanocapsule; Fluorescence; Nucleic Acid Detection

**Document Type:** Conference Paper

Al-Sehemi, A.G.<sup>a</sup>, Irfan, A.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Ammar, Y.A.<sup>a</sup>

## **Molecular design of new hydrazone dyes for dye-sensitized solar cells: Synthesis, characterization and DFT study**

(2012) *Journal of Molecular Structure*, 1019, pp. 130-134. Cited 4 times.

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<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

### **Abstract**

Three new sensitizers 2-{4-[2-(4-Nitrobenzylidene)hydrazino]phenyl} ethylene-1,1,2-tricarbonitrile (NBHPET), 2-{4-[2-p-Chlorobenzylidenehydrazino] phenyl}- ethylene-1,1,2-tri carbonitrile (CBHPET) and 2-{4-[2-p- Bromobenzylidenehydrazino] phenyl}ethylene-1,1,2-tricarbonitrile (BBHPET) have been synthesized. The dyes showed pronounced solvatochromic effects as the polarity of the solvents increased. The structures have been optimized at B3LYP/6-31G(d) level of theory. The torsion in E-isomer is smaller than Z-isomer and azo isomers. The highest occupied molecular orbitals are delocalized on whole molecule while lowest unoccupied molecular orbitals are distributed on the tricarbonitrile. The lowest unoccupied molecular orbital energies are above the conduction band of titanium dioxide, highest occupied molecular orbitals of the dyes are below the redox couple of new synthesized dyes and small energy gap revealed these dyes would be better sensitizers for dye-sensitized solar cells. © 2012 Elsevier B.V. All rights reserved.

### **Author Keywords**

Absorption; Density functional theory; Dye-sensitized solar cells; Transport properties

**Document Type:** Article



El-Daly, S.A.<sup>a b</sup>, El-Azim, S.A.<sup>a</sup>, Elmekawey, F.M.<sup>c</sup>, Elbaradei, B.Y.<sup>c</sup>, Shama, S.A.<sup>d</sup>, Asiri, A.M.<sup>b e</sup>

## **Photophysical parameters, excitation energy transfer, and photoreactivity of 1,4-bis(5-phenyl-2-oxazolyl)benzene (POPOP) laser dye**

(2012) *International Journal of Photoenergy*, 2012, art. no. 458126, . Cited 1 time.

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<sup>c</sup> Department of Physics, Faculty of Science, Tanta University, Tanta 31527, Egypt

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### **Abstract**

The effect of solvents on the absorption and emission spectra of 1,4-bis(5-phenyl-2-oxazolyl)benzene (POPOP) laser dye has been studied in various solvents at 298K. A bathochromic shift was observed in absorption and fluorescence spectra upon increase of solvent polarity, which indicates that this transition is  $\pi$ -\*. The ground and excited state dipole moments were calculated as 2.23 and 6.34 Debye, respectively. The dye solution in MeOH, n-heptane, and methyl isobutyl ketone gives laser emission in the blue region upon excitation by a 337.1nm nitrogen pulse; the gain coefficient and emission cross section as well as normalized photostability have been determined. Excitation energy transfer from POPOP to rhodamine B and fluoresceine was studied to improve the laser emission from these dyes. Such an energy transfer dye laser system (ETDL) obeys a long range columbic energy transfer mechanism with a critical transfer distance,  $R_0$ , of 25 and 33 Å and  $k_q$  equal to  $10.4 \times 10^{12}$  and  $26.2 \times 10^{12} \text{ M}^{-1} \text{ s}^{-1}$  for the POPOP/RB and POPOP/fluoresceine pair, respectively. The POPOP dye is highly photostable in polar protic and polar aprotic solvents, while it displays photodecomposition in chloromethane solvent via formation of a contact ion pair. The photochemical quantum yield and rate of photodecomposition depend on the electron affinity of solvent. Copyright © 2012 Samy A. El-Daly et al.

**Document Type:** Article

Faisal, M.<sup>a</sup>, Khan, S.B.<sup>b c</sup>, Rahman, M.M.<sup>b c</sup>, Jamal, A.<sup>a</sup>, Abdullah, M.M.<sup>a</sup>

## **Fabrication of ZnO nanoparticles based sensitive methanol sensor and efficient photocatalyst**

(2012) *Applied Surface Science*, 258 (19), pp. 7515-7522. Cited 13 times.

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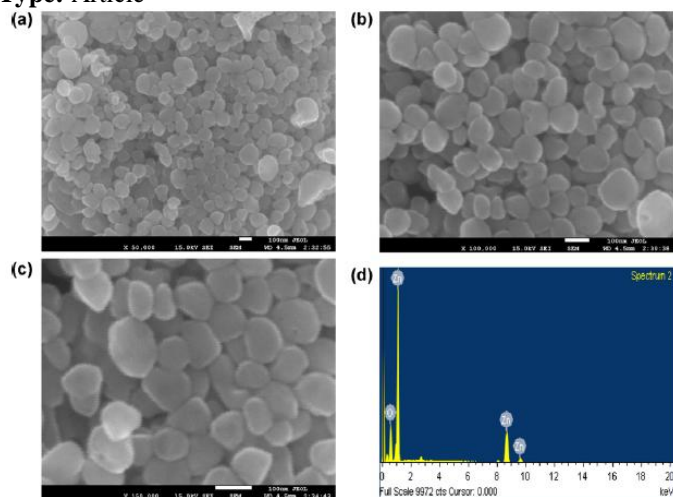
### **Abstract**

ZnO nanoparticles (NPs) were prepared by hydrothermal treatment with starting materials (zinc chloride and urea) in the presence of ammonium hydroxide and characterized by powder X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy and UV-vis spectroscopy. The synthesized nanoparticles are crystalline with wurtzite hexagonal phase having average particle size in the range of 80-130 nm. Photocatalytic activity of the prepared ZnO NPs was evaluated by the degradation of methylene blue and almost complete degradation (91.0%) takes place within 85 min of irradiation time. Prepared ZnO nanostructures possessed high photocatalytic activity when compared with TiO<sub>2</sub>-UV100. Additionally, the sensing properties of the ZnO films were investigated for various concentrations of methanol in liquid phase by simple I-V technique at room conditions. It was observed that ZnO thin film exhibits good sensitivity ( $0.9554 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ) towards detection of methanol at room conditions. © 2012 Elsevier B.V. All rights reserved.

### **Author Keywords**

Hydrothermal synthesis; Methanol chemical sensor; Methylene Blue; Photocatalyst; ZnO nanoparticles

### **Document Type: Article**



Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Luo, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

**Green photocatalytic synthesis of Ag nanoparticle-decorated TiO<sub>2</sub> nanowires for nonenzymatic amperometric H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Electrochimica Acta*, 74, pp. 275-279. Cited 3 times.

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<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

**Abstract**

Ag nanoparticle-decorated TiO<sub>2</sub> nanowires (AgNP-TiO<sub>2</sub> NWs) have been successfully fabricated through a green photocatalytic process, carried out by irradiating the mixture of AgNO<sub>3</sub> solution in ethanol and pre-formed TiO<sub>2</sub> NWs under UV light. Such nanocomposites exhibit remarkable catalytic performance toward the reduction of H<sub>2</sub>O<sub>2</sub> and this H<sub>2</sub>O<sub>2</sub> sensor shows a wide linear range of 0.1 mM to 60 mM ( $r = 0.991$ ) and a low LOD of 1.70  $\mu$ M at a signal-to-noise ratio of 3. © 2012 Elsevier Ltd.

**Author Keywords**

Ag nanoparticles; Green photocatalytic synthesis; Nonenzymatic H<sub>2</sub>O<sub>2</sub> detection; TiO<sub>2</sub> nanowires

**Document Type:** Article

Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Luo, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **Anchoring gold nanoparticles on graphene nanosheets functionalized with cationic polyelectrolyte: A novel catalyst for 4-nitrophenol reduction**

(2012) *Journal of Nanoscience and Nanotechnology*, 12 (4), pp. 2983-2989. Cited 4 times.

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### **Abstract**

In this paper, a stable aqueous dispersion of graphene nanosheets (GNs) has been prepared by chemical reduction of graphene oxide (GO) with hydrazine hydrate in the presence of poly [(2-ethyltrimethylammonioethyl methacrylate ethyl sulfate)-co-(1-vinylpyrrolidone)] (PQ11). Taking advantages of the fact that PQ11 is a positively charged polymer exhibiting reducing ability, we further demonstrated the subsequent decoration of GN with gold nanoparticles (AuNPs) by in-situ chemical reduction of HAuCl<sub>4</sub>. It was found that such nanocomposites exhibit good catalytic activity toward 4-nitrophenol (4-NP) reduction and the GN supports also enhance the catalytic activity via a synergistic effect. © 2012 American Scientific Publishers.

### **Author Keywords**

4-nitrophenol; Catalyst; Gold nanoparticle; Graphene nanosheet; PQ11

**Document Type:** Conference Paper

Khan, S.B.<sup>a,b</sup>, Rahman, M.M.<sup>a,b</sup>, Akhtar, K.<sup>c</sup>, Asiri, A.M.<sup>a,b</sup>, Seo, J.<sup>d</sup>, Han, H.<sup>e</sup>, Alamry, K.<sup>b</sup>

## **Novel and sensitive ethanol chemi-sensor based on nanohybrid materials**

(2012) *International Journal of Electrochemical Science*, 7 (5), pp. 4030-4038. Cited 7 times.

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### **Abstract**

Environmental pollution is one of the global hot issues and need an urgent demand to detect and monitor the pollutants which affect the environment. Ethanol is one of the organic pollutants which cause severe harmful effect on environment due to its toxic nature. For the detection and quantification of organic pollutants, sensors are the promising and reliable technology which has vital role in the environmental and health monitoring. A lot of sensor materials have been exposed but the prospective for industrial development as sensors and environmental supplement are still limited due to its non eco-friendly nature. Therefore, environmental friendly and biodegradable ethanol chemical sensors have been fabricated by efficient utilization of poly propylene carbonate (PPC) and PPC/silica hybrid (H) for the detection and quantification of ethanol in the environment. PPC/silica hybrid membrane has been synthesized by intercalation of silica into PPC matrix using a sol-gel technique. The resulting membrane was characterized by Fourier transform infrared spectroscopy (FTIR), while the morphology of the hybrid was investigated by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Both PPC and H performed as best ethanol chemi-sensor in term of sensitivity. Hybrid membrane showed 2.08 times higher sensitivity ( $0.5698 \mu\text{A.cm}^{-2}.\text{mM}^{-1}$ ) than pure PCC ( $0.2534 \mu\text{A.cm}^{-2}.\text{mM}^{-1}$ ). Hybrid membrane also displayed 3.1 times lower limit of detection (LOD,  $20.70 \mu\text{M}$ ) than pure PCC ( $64.29 \mu\text{M}$ ). Therefore, hybridization is an efficient route to fabricate proficient aqueous ethanol sensor.

### **Author Keywords**

Ethanol sensing; Hybrid membrane; Poly propylene carbonate; Structural properties; Tetraethoxysilicate

**Document Type:** Article

Khan, A.<sup>a</sup>, Asiri, A.M.<sup>a b</sup>, Rub, M.A.<sup>a</sup>, Azum, N.<sup>a</sup>, Khan, A.A.P.<sup>a</sup>, Khan, I.<sup>c</sup>, Mondal, P.K.<sup>d</sup>

## Review on composite cation exchanger as interdisciplinary materials in analytical chemistry

(2012) *International Journal of Electrochemical Science*, 7 (5), pp. 3854-3902. Cited 3 times.

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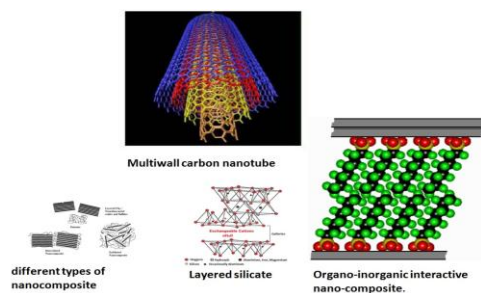
### Abstract

Green chemistry and technology is the design of chemical manufacturing systems to minimize their adverse affects on the environment. Thus, a primary goal of green chemistry and technology is to reduce the environmental impact of chemical processes and chemical manufacturing while simultaneously enhancing the overall process performance. Although it is beneficial to simply reduce the use of organic solvents in chemical processes, green chemistry and technology goes further, in that it evaluates the entire thing to identify techniques that can be applied to minimize the overall process hazard, while maintaining economic practicality. Evaluation of the environmental impacts of the manufacturing process requires a systematic approach and appropriate metrics that permit quantitative assessment of environmental hazards. Thus, this review begins with a introduction of cation-exchange materials the drivers for green technology and the metrics through which processes can be started. Then, the cation-exchange materials have so many applications described in this review and their many derivative and we describes inorganic to nanocomposite cation exchange materials and their technological improvement from old era to latest age of nano because green chemistry can be applied to real processes. Two elements are specifically highlighted: (a) the use of new materials to facilitate active and selective chemistry and the use of said materials within removal of environment hazardous. © 2012 by ESG.

### Author Keywords

A: Hybrid cation-exchanger; B: electrical properties; C: Hzardous recycling; D: nanocomposite

**Document Type:** Review



Li, H.<sup>a</sup>, Lu, W.<sup>a</sup>, Tian, J.<sup>a b</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>  
**Synthesis and study of plasmon-induced carrier behavior at Ag/TiO<sub>2</sub> nanowires**

(2012) *Chemistry - A European Journal*, 18 (27), pp. 8508-8514. Cited 5 times.

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### **Abstract**

Nanocomposites of Ag/TiO<sub>2</sub> nanowires with enhanced photoelectrochemical performance have been prepared by a facile solvothermal synthesis of TiO<sub>2</sub> nanowires and subsequent photoreduction of Ag<sup>+</sup> ions to Ag nanoparticles (AgNPs) on the TiO<sub>2</sub> nanowires. The as-prepared nanocomposites exhibited significantly improved cathodic photocurrent responses under visible-light illumination, which is attributed to the local electric field enhancement of plasmon resonance effect near the TiO<sub>2</sub> surface rather than by the direct transfer of charge between the two materials. The visible-light-driven photocatalytic performance of these nanocomposites in the degradation of methylene blue dye was also studied, and the observed improvement in photocatalytic activity is associated with the extended light absorption range and efficient charge separation due to surface plasmon resonance effect of AgNPs. Success with silver: Nanocomposites of Ag/TiO<sub>2</sub> nanowires have been prepared by a facile solvothermal synthesis of TiO<sub>2</sub> nanowires and subsequent photoreduction of Ag<sup>+</sup> ions to Ag nanoparticles on the TiO<sub>2</sub> nanowires (see figure). The nanocomposites exhibit significantly improved cathodic photocurrent responses under visible-light illumination due to the local electric field enhancement of the plasmon resonance effect near the TiO<sub>2</sub> surface. Copyright © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

### **Author Keywords**

nanoparticles; photocatalysis; photoreduction; silver; surface plasmon resonance; titanium

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**2-Hydroxy-2-trifluoromethyl-3,4-dihydro-2H-1-benzopyran-4-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2299.

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**Abstract**

The heterocyclic ring in the title compound, C<sub>10</sub>H<sub>7</sub>F<sub>3</sub>O<sub>3</sub>, has a half-boat conformation with the hydroxy-bearing C atom lying 0.595 (3) Å out of the plane of the five remaining atoms (r.m.s. deviation = 0.022 Å) in the direction of the hydroxy O atom. Linear supramolecular chains along the a axis, sustained by O - H...O hydrogen bonds between the hydroxy H and ketone O atoms, feature in the crystal packing. These chains are connected into a three-dimensional architecture by C - H...O and C - H...F contacts. © 2012 International Union of Crystallography.

**Document Type:** Article



Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2E)-2-(Thiophen-2-ylmethylidene)-1,2,3,4-tetrahydronaphthalen-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2298.

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<sup>c</sup> Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

**Abstract**

In the title compound, C<sub>15</sub>H<sub>12</sub>O<sub>S</sub>, the cyclohexene ring has a twisted boat conformation with the C atom between the ketone and methylene atom and this methylene C atom lying 0.280 (3) and 0.760 (3) Å, respectively, from the plane through the remaining four atoms (r.m.s. deviation = 0.004 Å). The dihedral angle between the benzene and thiophene rings [21.64 (9)°] indicates an overall twist in the molecule. The thiophene S and ketone O atoms are anti, an orientation that allows the close approach of these atoms [3.3116 (17) Å] in the crystal structure and which leads to the formation of helical supramolecular chains along the c axis. © 2012 International Union of Crystallography.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>  
**(3Z)-1,1,1-Trifluoro-4-phenyl-4-[(2-[(1Z)-4,4,4-trifluoro-3-oxo-1-phenylbut-1-en-1-yl]amino)ethylamino]but-3-en-2-one**  
(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2289-  
o2290.

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### Abstract

In the title compound, C<sub>22</sub>H<sub>18</sub>F<sub>6</sub>N<sub>2</sub>O<sub>2</sub>, the five atoms comprising each O=C - C=C - N fragment are almost coplanar (the r.m.s. deviation for the fitted atoms being 0.008 and 0.002 Å) and form a dihedral angle of 47.70 (12)°. The phenyl ring attached to each of the O=C - C=C - N fragments is twisted out of the respective plane with dihedral angles of 64.46 (11) and 61.82 (10)°, respectively. An almost orthogonal relationship for the phenyl rings is indicated by the dihedral angle between them of 78.19 (14)°. The conformation about each ethylene bond is Z, which allows for the formation of intramolecular N - H···O hydrogen bonds which close S(6) loops. The most prominent feature of the crystal packing are N - H···O hydrogen bonds that result in supramolecular chains along the a axis. The F atoms of one -CF<sub>3</sub> groups are disordered over three sets of sites with site-occupation factors of 0.318 (4), 0.360 (10) and 0.322 (9). © 2012 International Union of Crystallography.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-(3-Phenyl-3,3a,4,5-tetrahydro-2H-benzo[g]indazol-2-yl)benzenesulfonamide ethanol monosolvate**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2258-o2259. Cited 1 time.

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**Abstract**

In the title compound ethanol monosolvate, C<sub>23</sub>H<sub>21</sub>N<sub>3</sub>O<sub>2</sub>S·C<sub>2</sub>H<sub>5</sub>OH, the dihydropyrazole ring is twisted about the Csp<sup>3</sup> - Csp<sup>3</sup> bond. Nevertheless, the ring approximates a plane (r.m.s. deviation for the fitted atoms = 0.132 Å) and forms dihedral angles of 5.80 (13) and 12.29 (12)°, respectively, with the fused- and sulfonamide-benzene rings. As the dihydropyrazole C-bound phenyl group is roughly perpendicular to the dihydropyrazole ring [dihedral angle = 74.04 (15)°; the amino group is orientated to the same side of the molecule], to a first approximation, the molecule has a stunted T-shape. The cyclohexene ring adopts a half-chair conformation with the methylene C atom connected to the dihydropyrazole ring lying 0.665 (4) Å out of the plane of the five remaining atoms (r.m.s. deviation = 0.050 Å). The components of the asymmetric unit are connected by an O - H···O hydrogen bond. Further links between molecules leading to a three-dimensional architecture are of the type N - H···O. © 2012 International Union of Crystallography.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Alamry, K.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**5-Chloro-3,6-dimethyl-1-phenyl-1H,4H-pyrano[2,3-c]pyrazol-4-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2257.

<sup>a</sup> Center of Excellence for Advanced Materials Research (CEAMR), King Abdulaziz University, PO Box 80203, Jeddah 21589, Saudi Arabia

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**Abstract**

In the title compound, C<sub>14</sub>H<sub>11</sub>ClN<sub>2</sub>O 2, two independent molecules (A and B) comprise the asymmetric unit with the main difference between them being the relative orientation of the pendent phenyl ring with respect to the fused-ring system [dihedral angles = 8.32 (8)°(A) and 28.32 (8)°(B)]. In the crystal, the A molecules are connected into a linear supramolecular chain along the a axis via C - H···O interactions and linked to this via C - H···Cl interactions are the B molecules. The chains are connected into layers in the ab plane by  $\pi$ - $\pi$  interactions between pyrazole (A) and pyran (B) rings, and between pyrazole (B) and pyran (A) rings [centroid-centroid distances = 3.5442 (11) and 3.4022 (10) Å, respectively]. © 2012 International Union of Crystallography.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Saqer, A.A.A.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**8-Methyl-2-oxo-4-(thiophen-2-yl)-1,2,5,6,7,8-hexahydroquinoline-3-carbonitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (7), pp. o2291-o2292. Cited 1 time.

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<sup>c</sup> Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

**Abstract**

In the title compound, C<sub>15</sub>H<sub>14</sub>N<sub>2</sub>O<sub>2</sub>S, the pyridinone ring in the fused-ring system is nearly planar (r.m.s. deviation = 0.011 Å) and the cyclohexene ring has a twisted half-boat conformation with the methylene C atom adjacent to the methine C atom deviating by 0.592 (7) Å from the plane defined by the remaining five atoms (r.m.s. deviation = 0.108 Å). The thienyl ring is disordered over two almost coplanar positions of opposite orientation in a 0.649 (4):0.351 (4) ratio, and forms dihedral angles of 51.4 (3) (major component) and 54.2 (3)°, respectively, with the pyridinone ring. In the crystal, inversion-related molecules associate via an eight-membered {…HNCO}<sub>2</sub> synthon and these are linked into a linear supramolecular chain along the a axis by weak π-π interactions that occur between centrosymmetrically related pyridinone rings [centroid-centroid distance = 3.889 (2) Å]. © 2012 International Union of Crystallography.

**Document Type:** Article

Li, H.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Environmentally friendly photocatalytic synthesis of porphyrin/Ag nanoparticles/reduced graphene oxide ternary nanohybrids having superior catalytic activity**

(2012) *ChemPlusChem*, 77 (7), pp. 545-550. Cited 3 times.

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**Abstract**

This study demonstrates the first synthesis of novel organic/inorganic ternary nanohybrids of tin(IV) porphyrin (SnPor), Ag nanoparticles (AgNPs), and reduced graphene oxide (RGO) by an environmentally friendly photocatalytic process using SnPor as a photocatalyst for the reduction of both GO and AgI. The nanohybrids exhibit high photocurrent generation as a result of the photosensitization effect of SnPor and surface plasmon resonance excitation in the AgNPs. Furthermore, in the activity test, the nanohybrids show good catalytic activity in the degradation of rhodamine B under the irradiation of visible light ( $\lambda > 400$  nm) and in the reduction of 4-nitrophenol. The detailed mechanism is discussed in the article. © 2012 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

**Author Keywords**

Catalytic activity; Gold; Graphene; Nanohybrids; Photocatalysis

**Document Type:** Article

Lee, J.-W.<sup>a</sup>, Khan, S.B.<sup>b</sup>, Akhtar, K.<sup>c</sup>, Kim, K.-I.<sup>a</sup>, Yoo, T.-W.<sup>a</sup>, Kwang-Won Seo<sup>a</sup>, Han, H.<sup>a</sup>, Asiri, A.M.<sup>b</sup>

## Fabrication of composite membrane based on silicotungstic heteropolyacid doped polybenzimidazole for high temperature PEMFC

(2012) *International Journal of Electrochemical Science*, 7 (7), pp. 6276-6288. Cited 3 times.

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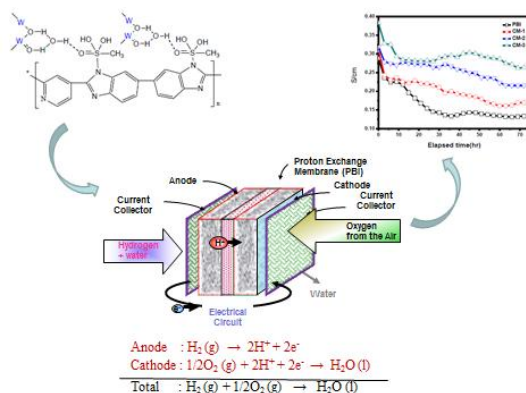
### Abstract

Stable proton conducting composite membranes (CM1-CM3) based on polybenzimidazole (PBI) and various weight percent (35, 50 and 65 wt %) of inorganic heteropoly acids (IHA) were prepared by dissolving PBI in methanesulfonic acid and required amount of IHA was then added to PBI solution. IHA were prepared by acid-catalyzed condensation of various ratios of silicotungstic acid (TSA) (35, 50 and 65 wt %) and silica (TEOS) (65, 50 and 35 wt %) using sol-gel procedure. These materials were characterized morphologically, studied their intrinsic structures and intimate relation with proton conductivity. It was found that thermal properties and proton conductivity of the composite membrane are strongly dependent on the IHA which increased with increase of IHA content. The composite membrane containing 65 wt % of IHA showed highest thermal property and proton conductivity. Composite membrane containing 65 wt % of IHA displayed highest conductivity of  $2.91 \times 10^{-1}$  S/cm at 150 °C. Thus introduction of IHA into PBI matrix is an efficient route to improve thermal properties and proton conductivity of PBI. © 2012 by ESG.

### Author Keywords

Composite membrane; Electrolyte; Inorganic heteropoly acid; Polybenzimidazole; Proton conductivity; Silicotungstic acid

Document Type: Article



Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Li, H.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

## **Fast and sensitive colorimetric detection of H<sub>2</sub>O<sub>2</sub> and glucose: A strategy based on polyoxometalate clusters**

(2012) *ChemPlusChem*, 77 (7), pp. 541-544.

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### **Abstract**

The first synthesis of novel organic/inorganic ternary nanohybrids of tin(IV) porphyrin (SnPor), Ag nanoparticles (AgNPs), and reduced graphene oxide (RGO) has been achieved by an environmentally friendly photocatalytic process using SnPor as a photocatalyst for the reduction of both GO and AgI. The nanohybrids show good catalytic activity in the degradation of rhodamine B under visible light (<400 nm, scheme of degradation by nanohybrids). © 2012 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

### **Author Keywords**

Colorimetric detection; Glucose; Peroxidase-like catalysts; Polyoxometalates; Sensors

**Document Type:** Article



Frantti, J.<sup>a</sup>, Fujioka, Y.<sup>a</sup>, Zhang, J.<sup>b</sup>, Wang, S.<sup>b</sup>, Vogel, S.C.<sup>b</sup>, Nieminen, R.M.<sup>a</sup>, Asiri, A.M.<sup>c,d</sup>, Zhao, Y.<sup>b</sup>, Obaid, A.Y.<sup>c,d</sup>, Mkhallid, I.A.<sup>c,d</sup>

## **High-pressure neutron study of the morphotropic lead-zirconate-titanate: Phase transitions in a two-phase system**

(2012) *Journal of Applied Physics*, 112 (1), art. no. 014104, . Cited 1 time.

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### **Abstract**

The present study was dedicated to the classical piezoelectric, lead-zirconate-titanate ceramic with composition  $\text{Pb}(\text{Zr}_{0.54}\text{Ti}_{0.46})\text{O}_3$  at the Zr-rich side of the morphotropic phase boundary at which two phases co-exists. The pressure-induced changes in the phase fractions were studied by high-pressure neutron powder diffraction technique up to 3 GPa and 773 K. The two co-existing phases were rhombohedral  $R\bar{3}c$  and monoclinic  $Cm$  at room temperature and  $R\bar{3}c$  and  $P4mm$  above 1 GPa and 400 K. The experiments show that pressure favors the  $R\bar{3}c$  phase over the  $Cm$  and  $P4mm$  phases, whereas at elevated temperatures entropy favours the  $P4mm$  phase. At 1 GPa pressure, the transition to the cubic  $Pm\bar{3}m$  phase occurred at around 600 K. Pressure lowers the  $Cm \rightarrow P4mm$  transition temperature. The  $Cm$  phase was found to continuously transform to the  $P4mm$  phase with increasing pressure, which is inline with the usual notion that the hydrostatic pressure favours higher symmetry structures. At the same time, the phase fraction of the  $R\bar{3}c$  phase was increasing, implying discontinuous  $Cm \rightarrow R\bar{3}c$  phase transition. This is in clear contrast to the polarization rotation model according to which the  $Cm$  would link the tetragonal and rhombohedral phases by being a phase in which the polarization would, more or less continuously, rotate from the tetragonal polarization direction to the rhombohedral direction. Pressure induces large changes in phase fractions contributing to the extrinsic piezoelectricity. The changes are not entirely reversible, as was revealed by noting that after high-pressure experiments the amount of rhombohedral phase was larger than initially, suggesting that on the Zr-rich side of the phase boundary the monoclinic phase is metastable. An important contribution to the intrinsic piezoelectricity was revealed: a large displacement of the B cations (Zr and Ti) with respect to the oxygen anions is induced by pressure. © 2012 American Institute of Physics.

**Document Type:** Article

Rahman, M.M.<sup>a,b</sup>, Khan, S.B.<sup>a,b</sup>, Jamal, A.<sup>c</sup>, Faisal, M.<sup>c</sup>, Asiri, A.M.<sup>a,b</sup>

## Highly sensitive methanol chemical sensor based on undoped silver oxide nanoparticles prepared by a solution method

(2012) *Microchimica Acta*, 178 (1-2), pp. 99-106. Cited 10 times.

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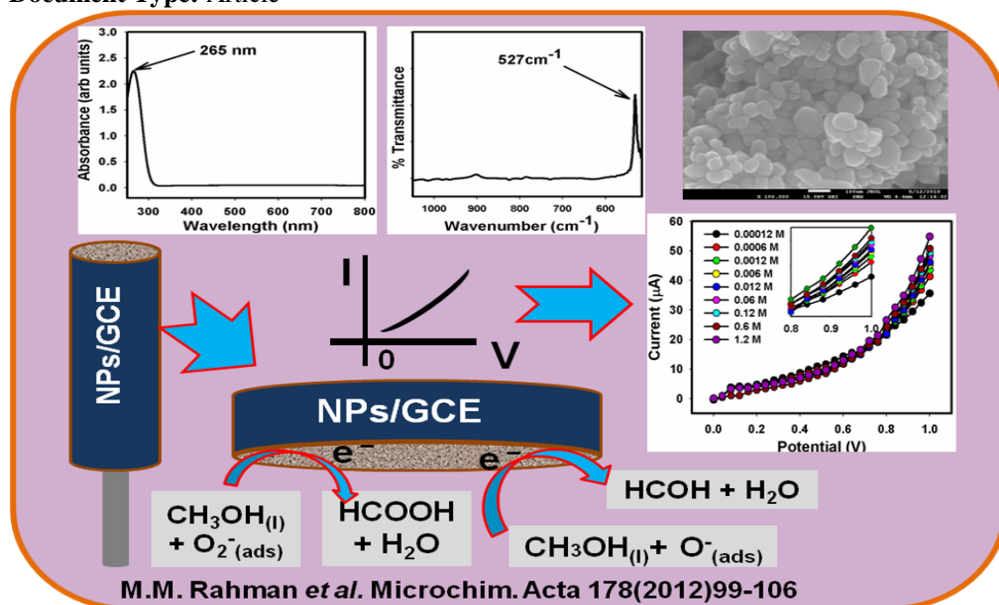
### Abstract

We have prepared silver oxide nanoparticles (NPs) by a simple solution method using reducing agents in alkaline medium. The resulting NPs were characterized by UV-vis and FT-IR spectroscopy, X-ray powder diffraction, and field-emission scanning electron microscopy. They were deposited on a glassy carbon electrode to give a sensor with a fast response towards methanol in liquid phase. The sensor also displays good sensitivity and long-term stability, and enhanced electrochemical response. The calibration plot is linear ( $r^2 = 0.8294$ ) over the 0.12 mM to 0.12 M methanol concentration range. The sensitivity is  $\sim 2.65 \mu\text{Acm}^{-2} \text{mM}^{-1}$ , and the detection limit is  $36.0 \mu\text{M}$  (at a SNR of 3). We also discuss possible future prospective uses of this metal oxide semiconductor nanomaterial in terms of chemical sensing. © 2012 Springer-Verlag.

### Author Keywords

I-V method; Methanol chemi-sensor; Optical properties; Silver oxide nanoparticles; Structural properties

Document Type: Article



Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **Novel synthesis of Au nanoparticles using fluorescent carbon nitride dots as photocatalyst**

(2012) *Gold Bulletin*, 45 (2), pp. 61-67. Cited 3 times.

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### **Abstract**

The present paper reports on a novel synthesis for Au nanoparticles (AuNPs) with the use of fluorescent carbon nitride dots (CNDs) as a photocatalyst. It suggests that the resultant CND-protected AuNPs (CNDs/AuNPs) exhibit good catalytic activity toward 4-nitrophenol reduction and that the CNDs enhance the catalytic activity via a synergistic effect. © The Author(s) 2012.

### **Author Keywords**

4-nitrophenol reduction; Au nanoparticle; Carbon nitride dot; Fluorescence; Photocatalyst; Synergistic effect

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Khan, S.A.<sup>a</sup>, Al-Amoudi, M.S.<sup>c</sup>, Alamry, K.A.<sup>a</sup>

**Synthesis, characterization, absorbance, fluorescence and non linear optical properties of some donor acceptor chromophores**

(2012) *Bulletin of the Korean Chemical Society*, 33 (6), pp. 1900-1906. Cited 1 time.

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**Abstract**

Three carbazole chromophores featuring dicyano, cyano, ethyl acetate and dimethyl acetate groups as an acceptor moiety with a  $\pi$ -conjugated spacer and N-methyl dibenzo[b]pyrrole as donor were synthesized by Knoevenagel condensation and characterized by IR, <sup>1</sup>HNMR, <sup>13</sup>CNMR, UV-vis, fluorescence spectroscopy, electrochemistry and theoretical B3LYP/6-311G \* level whilst NLO properties and spectroscopic quantities were calculated. Calculations showed remarkable trend with HOMO located on the donor moiety and LUMO on the acceptors dicyano methylene, cyano, ethyl acetate methylene and dimethyl acetate methylene. In agreement with the calculations, solvatochromic, behavior intramolecular charge transfer band was observed in the visible region.

**Author Keywords**

Carbazole aldehyde; Knoevenagel condensation; NLO chromophore; Pyridine

**Document Type:** Article

Lu, W.<sup>a</sup>, Qin, X.<sup>a</sup>, Liu, S.<sup>a</sup>, Chang, G.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

**Economical, green synthesis of fluorescent carbon nanoparticles and their use as probes for sensitive and selective detection of mercury(II) ions**

(2012) *Analytical Chemistry*, 84 (12), pp. 5351-5357. Cited 13 times.

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**Abstract**

The present article reports on a simple, economical, and green preparative strategy toward water-soluble, fluorescent carbon nanoparticles (CPs) with a quantum yield of approximately 6.9% by hydrothermal process using low cost wastes of pomelo peel as a carbon source for the first time. We further explore the use of such CPs as probes for a fluorescent Hg 2+ detection application, which is based on Hg 2+-induced fluorescence quenching of CPs. This sensing system exhibits excellent sensitivity and selectivity toward Hg 2+, and a detection limit as low as 0.23 nM is achieved. The practical use of this system for Hg 2+ determination in lake water samples is also demonstrated successfully. © 2012 American Chemical Society.

**Document Type:** Article

Rahman, M.M.<sup>a,b</sup>, Khan, S.B.<sup>a,b</sup>, Jamal, A.<sup>c</sup>, Faisal, M.<sup>c</sup>, Asiri, A.M.<sup>a,b</sup>

## Fabrication of a methanol chemical sensor based on hydrothermally prepared $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> codoped SnO<sub>2</sub> nanocubes

(2012) *Talanta*, 95, pp. 18-24. Cited 14 times.

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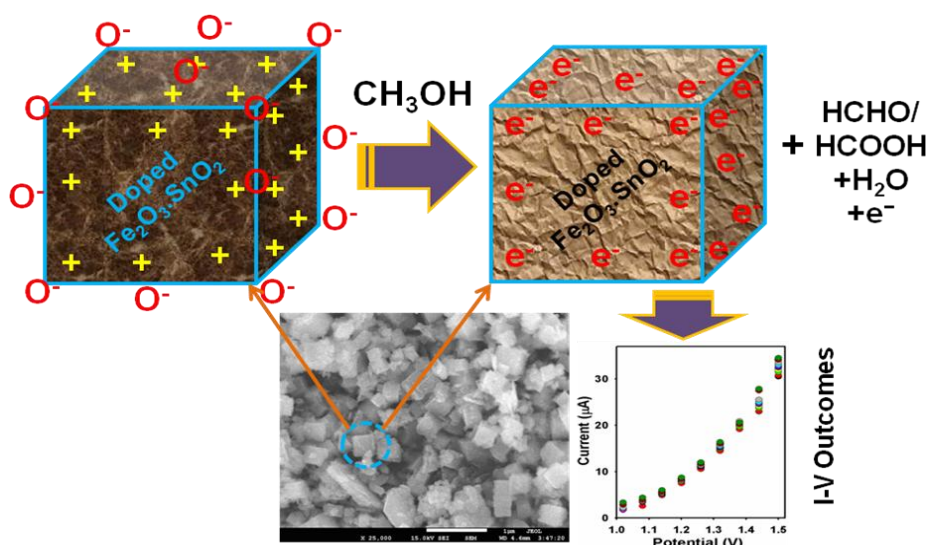
### Abstract

We have prepared calcined  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> codoped SnO<sub>2</sub> nanocubes (NCs) by a hydrothermal method using reducing agents in alkaline medium. The codoped NCs were characterized by UV/vis, FT-IR, and Raman spectroscopy, powder X-ray diffraction (XRD), and field-emission scanning electron microscopy (FESEM). They were deposited on a silver electrode (AgE, surface area, 0.0216 cm<sup>2</sup>) to give a sensor with a fast response towards methanol in liquid phase. The sensor also exhibits good sensitivity and long-term stability, and enhanced electrochemical response. The calibration plot is linear ( $r^2 = 0.9809$ ) over the 0.25 mmol L<sup>-1</sup> to 0.25 mol L<sup>-1</sup> methanol concentration range. The sensitivity is  $\sim 5.79 \mu\text{A cm}^{-2} \text{mM}^{-1}$ , and the detection limit is  $0.16 \pm 0.02$  mmol L<sup>-1</sup> (signal-to-noise ratio, at a SNR of 3). We also discuss possible future prospective uses of this codoped semiconductor nanomaterial in terms of chemical sensing. © 2012 Elsevier B.V. All rights reserved.

### Author Keywords

$\alpha$ -Fe<sub>2</sub>O<sub>3</sub> codoped SnO<sub>2</sub> NCs; I-V method; Methanol chemical sensor; Optical properties; Sensitivity; Structural properties

Document Type: Article



Marwani, H.M.<sup>a b</sup>, Albishri, H.M.<sup>a</sup>, Jalal, T.A.<sup>a</sup>, Soliman, E.M.<sup>a</sup>

**Activated carbon immobilized dithizone phase for selective adsorption and determination of gold(III)**

(2012) *Desalination and Water Treatment*, 45 (1-3), pp. 128-135. Cited 3 times.

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**Abstract**

A simple method for selective adsorption and determination of gold(III) based on activated carbon immobilized dithizone (AC-DTZ) phase combined with inductively coupled plasmaoptical emission spectrometry was developed. Surface properties of the new chemically modified AC-DTZ phase were confirmed by Fourier transform infrared spectroscopy. The effect of pH on the selectivity of AC-DTZ towards eight metal ions, including Au(III), Cd(II), Co(II), Cu(II), Fe(III), Ni(II), Pb(II) and Zn(II), was investigated. Based on the pH study, it was found that the selectivity of AC-DTZ phase was the most towards Au(III). For a deeper mechanistic understanding of the analytical potential of the AC-DTZ phase towards Au(III), other factors influencing the maximum uptake of Au(III) on AC-DTZ were also investigated. The results showed that the adsorption capacity for Au(III) was improved by 64.07% with the AC-DTZ phase as compared to the carboxylic acid derivative of activated carbon after only 1 h contact time. Adsorption isotherm data confirmed that the adsorption process was mainly monolayer on a homogeneous adsorbent surface. Results displayed that the adsorption of Au(III) onto the AC-DTZ phase obeyed a pseudo second-order kinetic model. In addition, the efficiency of this methodology was supported by applying it to real water samples with satisfactory results. © 2012 Desalination Publications. All rights reserved.

**Author Keywords**

Au(III); Batch method; Dithizone; ICP-OES; Modified activated carbon; Separation

**Document Type:** Article

Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**A novel acid-driven, microwave-assisted, one-pot strategy toward rapid production of graphitic N-doped carbon nanoparticles-decorated carbon flakes from N,N-dimethylformamide and their application in removal of dye from water**

(2012) *RSC Advances*, 2 (11), pp. 4632-4635. Cited 4 times.

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**Abstract**

The present communication reports on a novel one-pot strategy toward rapid production of N-doped carbon nanoparticles-decorated carbon flakes (N-CNP-CFs) by microwave irradiation of N,N-dimethylformamide in the presence of H<sub>3</sub>PO<sub>4</sub> for the first time. It suggests these N-CNP-CFs exhibit excellent ability to remove dye from water. © 2012 The Royal Society of Chemistry.

**Document Type:** Article



Akhtaruzzaman, M.<sup>a</sup>, Seya, Y.<sup>a</sup>, Asao, N.<sup>b</sup>, Islam, A.<sup>c</sup>, Kwon, E.<sup>d</sup>, El-Shafei, A.<sup>e</sup>, Han, L.<sup>c</sup>, Yamamoto, Y.<sup>b,f</sup>

## **Donor-acceptor dyes incorporating a stable dibenzosilole $\pi$ -conjugated spacer for dye-sensitized solar cells**

(2012) *Journal of Materials Chemistry*, 22 (21), pp. 10771-10778. Cited 6 times.

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### **Abstract**

Four novel organic dyes including three based on dibenzosilole (YS01-03) and one based on fluorene (YS04) were synthesized, and their photophysical properties and dye-sensitized solar cell (DSC) performances were characterized. The silicon-containing dibenzosilole-based dyes (YS01-03) were superior to the carbon analogue fluorene-based dye YS04 in incident-photon-to-current conversion efficiency (IPCE), and total solar-to-electric conversion efficiency ( $\eta$ ), with YS03, which has the bulkiest and most branched electron donor group, achieving the highest  $\eta$  of 5.07% compared to 2.88% of YS04. To better understand how silicon influences the excited state oxidation potentials ( $S^{+/*}$ ) and absorption maxima ( $\lambda_{max}$ ), the equilibrium molecular geometries of dyes YS01-04 were calculated using density functional theory (DFT) utilizing B3LYP energy functional and DGDZVP basis set. It was shown that the torsion angles (1 and 2) across the biphenyl linkages of dyes containing silicon (YS01-03) were less twisted than that of the silicon-free dye (YS04), which enhanced the  $\pi$ - $\pi^*$  overlap, and that translated into photocurrent enhancements in the silicon-containing dyes YS01-03. Moreover, the vertical electronic excitations and  $S^{+/*}$  of dyes YS01-04 were studied using different long-range corrected time-dependent DFT methods, including CAM-B3LYP, LC-BLYP, WB97XD, and LC-wPBE at the basis set level DGDZVP. Excellent agreement between the calculated, using CAM-B3LYP/DGDZVP, and experimental results was found. © The Royal Society of Chemistry 2012.

**Document Type:** Article

Shafiq, M.<sup>a, b</sup>, Khan, I.U.<sup>a</sup>, Zia-Ur-Rehman, M.<sup>c</sup>, Asghar, M.N.<sup>d</sup>, Asiri, A.M.<sup>e</sup>, Arshad, M.N.<sup>f</sup>

## Synthesis and antioxidant activity of a new series of 2,1-benzothiazine 2,2-dioxide hydrazine derivatives

(2012) *Asian Journal of Chemistry*, 24 (10), pp. 4799-4803. Cited 1 time.

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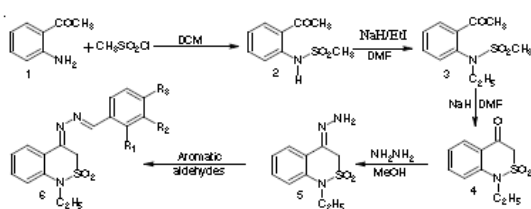
### Abstract

A convenient synthesis of a series of new N-benzylidene-N'-(1-ethyl-2, 2-dioxo-2,3-dihydro-1H-2λ 6-benzo[c][1,2]thiazin-4-ylidene) -hydrazines is reported. The starting compound methyl anthranilate was reacted with methane sulfonyl chloride, followed by N-ethylation and cyclization reactions. This cyclized 2,1-benzothiazine 2,2-dioxide molecule was then subjected for hydrazinolysis with hydrazine followed by condensation reactions with a number of aromatic aldehydes yielding the 2,1-benzothiazine 2,2-dioxide hydrazine. Structural elucidation was achieved by FT-IR, <sup>1</sup>H and <sup>13</sup>C NMR and single crystal X-ray diffraction analyses. Crystal structure data for 6a has been given with a brief structural discussion. The newly synthesized compounds were then screened for their antioxidant activity by ABTS radical cation decolourization assay and metal chelating activity.

### Author Keywords

ABTS radical cation assay; Crystal structure; Metal chelating activity

### Document Type: Article



Compd.	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	Compd.	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
6a	H	H	H	6f	H	CH <sub>3</sub>	H
6b	H	H	F	6g	H	H	N(CH <sub>3</sub> ) <sub>2</sub>
6c	Cl	H	H	6h	H	OCH <sub>3</sub>	OH
6d	H	Cl	H	6i	- <sup>a</sup>	-	-
6e	OH	H	H	6j	- <sup>b</sup>	-	-

<sup>a</sup>trans-cinnamaldehyde, <sup>b</sup>9-anthranaldehyde

Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Luo, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>  
**Ag nanoparticles decorated 2,4,6-tris (2-pyridyl)-1,3,5-triazine nanobelts: Synthesis and their application as sensitive SERS substrate**

(2012) *Current Nanoscience*, 8 (3), pp. 393-397.

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**Abstract**

In this communication, we report on the preparation of Ag nanoparticle-decorated 2,4,6-tris (2-pyridyl)-1,3,5-triazine nanobelts (AgNP-TPTNBs) by mixing a AgNO<sub>3</sub> aqueous solution and pre-formed TPTNBs with the aid of sodium hydroxide in the absence of any external reducing agent. The formation mechanism of AgNP-TPTNBs is discussed from the seed-mediated growth and considering the reduction potential of triazine and Ag(I) ions under alkaline conditions. It is found that the resultant AgNP-TPTNBs show great potential of Surface-enhanced Raman scattering (SERS) technique with high sensitivity up to  $1.0 \times 10^{-10}$  M by using p-aminothiophenol (p-ATP) as the model Raman probe. © 2012 Bentham Science Publishers.

**Author Keywords**

2,4,6-tris (2-pyridyl)-1,3,5-triazine; Ag nanoparticle; Nanobelt; SERS

**Document Type:** Article

Rahman, M.M.<sup>a b</sup>, Bahadar Khan, S.<sup>a b</sup>, Jamal, A.<sup>c</sup>, Faisal, M.<sup>c</sup>, Asiri, A.M.<sup>a b</sup>

## **Fabrication of highly sensitive acetone sensor based on sonochemically prepared as-grown Ag<sub>2</sub>O nanostructures**

(2012) *Chemical Engineering Journal*, 192, pp. 122-128. Cited 14 times.

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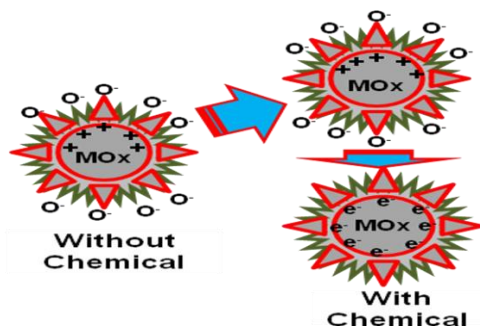
### **Abstract**

The sono-chemical synthesis of silver oxide nanostructures was achieved by ultrasonic irradiation in aqueous alkaline solution (pH8.33) at room conditions, where silver nitrate and urea were used as starting materials. The structures of as-grown Ag<sub>2</sub>O micro-flower (composed of nanosheets) were characterized using powder X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM), UV/visible, Fourier transform infra-red (FT-IR), and Raman spectroscopy's etc. The chemical composition of Ag<sub>2</sub>O nanostructures was investigated by energy-dispersive X-ray spectrum (EDS). As-grown Ag<sub>2</sub>O nanosheets were applied for the chemical sensing using simple I-V technique in liquid phase system, where acetone was used as a target analyte. The analytical performances of acetone sensors with Ag<sub>2</sub>O using glassy carbon electrode (GCE) have good sensitivity, lower detection limit, and long-term stability in their electro-chemical responses. The calibration plot was linear ( $R=0.9462$ ) over the large dynamic concentration range (0.13 $\mu$ M to 0.67M). The sensitivity was calculated to 1.6985 $\mu$ Ac<sub>m</sub>-2mM<sup>-1</sup> with lower detection limit (0.11 $\mu$ M) based on a signal/noise ratio (3N/S) in short response time. Finally it was confirmed that the micro-flower morphologies (composed of nanosheets) and the optical features of silver oxide can be extended to a large range in un-doped semiconductor nanomaterials for proficient chemical sensor applications. © 2012 Elsevier B.V..

### **Author Keywords**

Acetone sensor; Ag<sub>2</sub>O nanostructures; I-V technique; Optical properties; Sensitivity; Structural properties

**Document Type:** Article



Sun, X.<sup>a b c</sup>, Qin, X.<sup>a</sup>, Hu, J.<sup>b</sup>, Luo, Y.<sup>a</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>

## **Heat treatment-based one-step preparation of highly concentrated, well-stable silver colloids that can form stable films on bare electrodes for H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Current Nanoscience*, 8 (3), pp. 335-342. Cited 1 time.

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### **Abstract**

A simple thermal process for the one-step preparation of highly concentrated (up to 0.21 M) but well-stable silver colloids with a bimodal size distribution is developed for the first time, carried out by directly heating an aqueous solution of concentrated AgNO<sub>3</sub> and poly[(2-ethyltrimethylammonioethyl methacrylate ethyl sulfate)-co- (1-vinylpyrrolidone)] (PQ11), a kind of cationic polyelectrolyte, at 100 °C without the extra introduction of other reducing agents and protective agents. Time-dependent UV-vis spectra were collected to gain further insight into the Ag nanoparticles (AgNPs) formation process. Most importantly, it is found that the colloidal solution can form stable films on bare electrode surfaces and the AgNPs contained therein exhibit notable catalytic activity toward the reduction of H<sub>2</sub>O<sub>2</sub>, leading to a H<sub>2</sub>O<sub>2</sub> sensor with a fast amperometric response time of less than 2 s. The linear detection range is estimated to be from 100 μM to 150 mM ( $r = 0.9995$ ), and the detection limit is estimated to be 1.8 μM at a signal-to-noise ratio of 3.

### **Author Keywords**

Ag nanoparticle; H<sub>2</sub>O<sub>2</sub> detection; One-step; Polyelectrolyte

**Document Type:** Article

Wang, J.<sup>a</sup>, Xue, C.<sup>a</sup>, Wu, Z.<sup>a</sup>, Li, W.<sup>a</sup>, Lv, Y.<sup>a</sup>, Asiri, A.M.<sup>b</sup>, Tu, B.<sup>a</sup>, Zhao, D.<sup>a</sup>

## **Hollow micro-mesoporous carbon polyhedra produced by selective removal of skeletal scaffolds**

(2012) *Carbon*, 50 (7), pp. 2546-2555. Cited 2 times.

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### **Abstract**

An approach has been demonstrated for fabricating hollow micro-mesoporous carbon polyhedra by selective removal of the skeletal scaffolds of polyurethane (PU) foam in monolithic mesostructured resin/PU composites. Hollow micro-mesoporous carbon polyhedra with an irregular shape molded from the cellular cavities of PU foam were synthesized by using phenolic resol as a precursor, triblock copolymer Pluronic F127 as a template, PU foam as a skeletal scaffold and triethyl phosphate as a reaction agent. By a reaction with triethyl phosphate, the PU foam in resin/PU composites can be degraded, simultaneously leading to the disassembly of the monolithic structure into separated polyhedral particles. The method can also be used for synthesizing hollow micro-mesoporous carbon-silica polyhedra, using tetraethyl orthosilicate as a silica source. Moreover, after etching the silica away, hollow micro-mesoporous carbon polyhedra with an ordered hexagonal mesostructure (space group  $p6mm$ ), large particle sizes of 65-500  $\mu\text{m}$ , a large surface area of 1384  $\text{m}^2 \text{g}^{-1}$ , a uniform pore size of 3.2 nm and a high pore volume of 1.15  $\text{cm}^3 \text{g}^{-1}$  as well as a high mesoporosity of 81% can be obtained, which exhibits excellent adsorption performance toward methylene blue compared with the active carbon having a similar surface area. © 2012 Elsevier Ltd. All rights reserved.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>

**Improved photochromic and fatigue performance of (E)-dicyclopropylmethylene-(2,5-dimethyl-3-furylethylidene)-succinicanhydride doped in polyurethane thin film**

(2012) *Polymer Engineering and Science*, 52 (6), pp. 1212-1216.

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**Abstract**

Improved photochromic properties and fatigue performance of (E)-dicyclopropylmethylene-(2,5-dimethyl-3-furylethylidene)-succinicanhydride doped in polyurethane thin film were discussed in this study. Fulgide 1-E doped in polyurethane polymer films was heated at various annealing temperatures. Upon irradiation with UV light (366 nm), fulgide 1-E undergoes a conrotatory ring closure to the pink-colored closed form 1-C. The latter color was switched back to the original color when the films were irradiated with white light. The kinetics of photocoloration and photobleaching processes was followed spectrophotometrically by monitoring the absorbance of the ring-closed product 1-C at its  $\lambda$  max of 525 nm. The first-order plots of photocoloration reaction show distinct linear line and the slope of which corresponding to the first-order rate constants  $k$ . It was found that for photocoloration reaction, the rate constant of the photocoloration reaction is slower than the photobleaching reaction, and both reactions decrease with increasing the annealing temperatures. It was found that there was almost complete loss of photochemical fatigue resistance of fulgide 1 doped in polyurethane polymer film irrespective of the annealing temperature. © 2011 Society of Plastics Engineers.

**Document Type:** Article

Arshad, M.N.<sup>a</sup>, Khan, I.U.<sup>b</sup>, Zia-Ur-Rehman, M.<sup>c</sup>, Ahmed, W.<sup>d</sup>, Asiri, A.M.<sup>e f</sup>

## Methyl 2-butyl-4-hydroxy-1,1-dioxo-2H-1,2-benzothiazine-3-carboxylate

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (6), pp. o1663. Cited 1 time.

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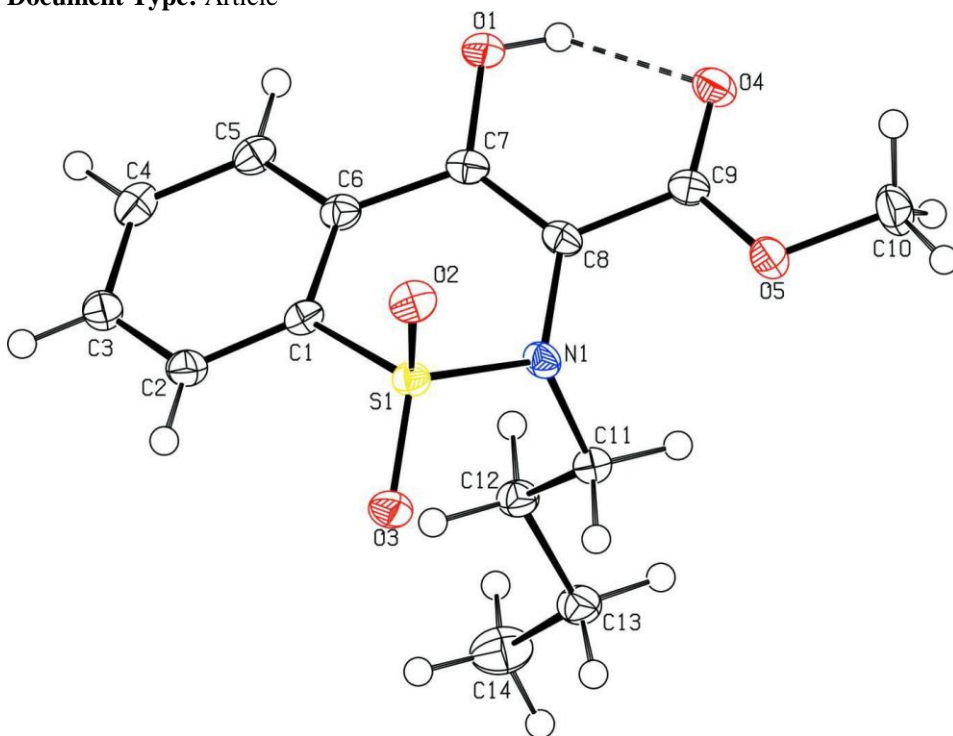
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### Abstract

In the title compound, C<sub>14</sub>H<sub>17</sub>NO<sub>5</sub>S, the thiazine ring adopts a half-chair conformation. The molecule exhibits an intramolecular O - H···O hydrogen bond, which forms a six-membered S(6) ring motif. The planes of the benzene and thiazine rings are inclined at a dihedral angle of 15.30 (12)°.

**Document Type:** Article





Li, H.<sup>a</sup>, Chang, G.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Liu, S.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Photocatalytic synthesis of highly dispersed Pd nanoparticles on reduced graphene oxide and their application in methanol electro-oxidation**

(2012) *Catalysis Science and Technology*, 2 (6), pp. 1153-1156. Cited 6 times.

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**Abstract**

In this communication, we present a green photocatalytic method for the synthesis of highly dispersed Pd nanoparticles (PdNPs) with an average diameter of  $ca.10 \pm 1$  nm on the surface of reduced graphene oxide (RGO), using tin(IV) porphyrin (SnP) as a photocatalyst for the reduction of both graphene oxide (GO) and Pd(II). The as-prepared PdNPs-RGO nanocomposites exhibit higher electrocatalytic activities than the commercial Pd/C catalyst for methanol electro-oxidation in alkaline media. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Al-Sehemi, A.G.<sup>a</sup>, Irfan, A.<sup>a</sup>, Asiri, A.M.<sup>b,c</sup>, Ammar, Y.A.<sup>a</sup>

## **Synthesis, characterization and DFT study of methoxybenzylidene containing chromophores for DSSC materials**

(2012) *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 91, pp. 239-243. Cited 7 times.

<sup>a</sup> Chemistry Department, Faculty of Science, King Khalid University, Abha, Saudi Arabia

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### **Abstract**

Novel tricyanovinyl derived from hydrazones have been prepared by the reaction of tetracyanoethylene and phenylethylidene hydrazone, and these dyes showed absorption in the region of 539-650 nm. The dyes showed pronounced solvatochromic effects as the polarity of the solvents changed. The torsion in E isomer is smaller than Z and azo isomers of MBD1 and MBD2. The HOMOs are delocalized on whole of the molecule while LUMOs are distributed on the tricarbonitrile. The LUMO energies are above the conduction band of TiO<sub>2</sub> and HOMOs of the dyes are below the redox couple of MBD1 and MBD2. The HOMO energies, LUMO energies and HOMO-LUMO energy gap of MBD1 and MBD2 are almost same. The absorption spectra of both the dyes in different solvents are approximately same except in cyclohexane. © 2012 Elsevier B.V. All rights reserved.

### **Author Keywords**

Absorption; Dye-sensitized solar cells; HOMO; LUMO

**Document Type:** Article

Irfan, A.<sup>a</sup>, Al-Sehemi, A.G.<sup>a</sup>, Asiri, A.M.<sup>b,c</sup>

## Theoretical investigations of the charge transfer properties in oligothiophene derivatives

(2012) *Journal of Theoretical and Computational Chemistry*, 11 (3), pp. 631-640. Cited 1 time.

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<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589 P. O. Box 80203, Saudi Arabia

### Abstract

The structures of 5,5'-bis(naphth-2-yl)-2,2'-bithiophene (NaT2), 5,5''-bis(naphth-2-yl)-2,2':5',2'-terthiophene (NaT3), 5,5'-bis(naphth-2-yl)-2,2':5',2'':5'', 2'-tetrathiophene (NaT4), 5,5''''-bis(naphth-2-yl)-2,2':5',2'':5'',2'':5'',2''''-quinquethiophene (NaT5) and 5,5''''''-bis(naphth-2-yl)-2,2':5',2'':5'',2'':5'',2''':5''',2''''-sexithiophene (NaT6) have been optimized at PBE1PBE/6-31G\* level of theory. By increasing the chain length (thiophene units) energy gap decreases. The hole reorganization energy also decreases from NaT2NaT6. We have observed that mobility of NaT5 and NaT6 can be enhanced by minimizing the polarization and relaxation. The end-capped naphthyl groups have been rotated from 0°60° in the case study of NaT2, it was found that hole reorganization energy increases with the increment in angle. Furthermore the charge transport properties of 5,5'-bis(thionaphth-2-yl)-2,2'- bithiophene (TNT2), 5,5''-bis(thionaphth-2-yl)-2,2':5', 2''-terthiophene (TNT3), and 5,5'-bis(thionaphth-2-yl)-2,2':5',2'':5'',2'-quaterthiophene (TNT4) have been investigated at the same level of theory. It has been studied that cis isomers have higher hole reorganization energies as compared to trans ones thus these isomers would diminish the mobility. © 2012 World Scientific Publishing Company.

### Author Keywords

HOMO; LUMO; Oligothiophene; reorganization energy; structureproperty relationship

**Document Type:** Article

Lu, W.<sup>a</sup>, Liu, S.<sup>a</sup>, Qin, X.<sup>a</sup>, Wang, L.<sup>a</sup>, Tian, J.<sup>a b</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**High-yield, large-scale production of few-layer graphene flakes within seconds: Using chlorosulfonic acid and H<sub>2</sub>O<sub>2</sub> as exfoliating agents**

(2012) *Journal of Materials Chemistry*, 22 (18), pp. 8775-8777. Cited 6 times.

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**Abstract**

The present communication reports on a rapid exfoliation method for high-yield production of few-layer graphene flakes on a large scale from graphite within seconds with the use of chlorosulfonic acid and H<sub>2</sub>O<sub>2</sub> as exfoliating agents. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Farooq, U.<sup>a</sup>, Khan, A.<sup>a</sup>, Khan, S.S.<sup>b</sup>, Iqbal, S.<sup>c</sup>, Sarwar, R.<sup>a</sup>, Khan, S.B.<sup>d</sup>, Ahmad, V.U.<sup>d</sup>

### **Isolation and structure determination of three new sesquiterpenoids from *Achillea millefolium***

(2012) *Zeitschrift für Naturforschung - Section B Journal of Chemical Sciences*, 67 (5), pp. 421-425. Cited 1 time.

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#### **Abstract**

Phytochemical investigation of the whole plant of *Achillea millefolium* led to the isolation of three new sesquiterpenes which were trivially named as sesquiterpene lactone-esters A and B (1 and 2), and sesquiterpene lactone-diol (3). The structures of these compounds were determined with the help of one- and two-dimensional (1D and 2D) NMR techniques including <sup>1</sup>H NMR, <sup>13</sup>C NMR, HMQC, HMBC, COSY, and NOESY experiments. © 2012 Verlag der Zeitschrift für Naturforschung.

#### **Author Keywords**

*Achillea millefolium*; Compositae; Lactone-diol; Lactone-ester; Sesquiterpenes

**Document Type:** Article

Han, L.<sup>a</sup>, Lv, Y.<sup>a</sup>, Asiri, A.M.<sup>b</sup>, Al-Youbi, A.O.<sup>b</sup>, Tu, B.<sup>a</sup>, Zhao, D.<sup>a</sup>

**Novel preparation and near-infrared photoluminescence of uniform core-shell silver sulfide nanoparticle@mesoporous silica nanospheres**

(2012) *Journal of Materials Chemistry*, 22 (15), pp. 7274-7279. Cited 3 times.

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**Abstract**

In this paper, we report a facile one-pot route to prepare core-shell Ag 2S@MSN mesoporous silica nanospheres with near-infrared (NIR) photoluminescent properties. The Ag 2S@MSN nanospheres have uniform core-shell structures with single monoclinic  $\alpha$ -Ag 2S nanocrystal core (~17 nm), ordered mesoporous silica shell (the thickness of ~20 nm), very high surface area (~909 m<sup>2</sup> g<sup>-1</sup>), and uniform pore size (~2.6 nm). The core-shell Ag 2S@MSN nanospheres show NIR emission at around 1275 nm excited by a 648 nm laser diode, which can be observed in a wide range of concentration (0.2~3.2 mg mL<sup>-1</sup>). The stability of the NIR photoluminescence for the core-shell Ag 2S@MSN nanospheres is greatly improved compared to the bare Ag 2S nanocrystals. The NIR emission intensity could be enhanced after the hydrothermal treatment with the increase of crystallinity of the silver sulfide cores. The thickness of mesoporous silica shell could be tuned by adjusting the amount of silica source. Furthermore, the core-shell Ag 2S@MSN nanocomposites with several small Ag 2S nanoparticles in one mesoporous silica shell could also be obtained, which may be a good candidate for bioimaging and biolabeling. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Qin, X.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Hydrothermal treatment of grass: A low-cost, green route to nitrogen-doped, carbon-rich, photoluminescent polymer nanodots as an effective fluorescent sensing platform for label-free detection of Cu(II) ions**

(2012) *Advanced Materials*, 24 (15), pp. 2037-2041. Cited 32 times.

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**Abstract**

Increasing reaction temperature produces photoluminescent polymer nanodots (PPNDs) with decreased particle size and increased quantum yield. Such PPNDs are used as an effective fluorescent sensing platform for label-free sensitive and selective detection of Cu(II) ions with a detection limit as low as 1 nM. This method is successfully applied to determine Cu<sup>2+</sup> in real water samples. Copyright © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

**Author Keywords**

grass; ion detection; nitrogen-doped; photoluminescent; polymer nanodots

**Document Type:** Article

Tian, J.<sup>a b</sup>, Liu, S.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Li, H.<sup>a</sup>, Wang, L.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Environmentally friendly, one-pot synthesis of Ag nanoparticle-decorated reduced graphene oxide composites and their application to photocurrent generation**

(2012) *Inorganic Chemistry*, 51 (8), pp. 4742-4746. Cited 18 times.

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**Abstract**

In this paper, we develop an environmentally friendly, one-pot strategy toward rapid preparation of Ag nanoparticle-decorated reduced graphene oxide (AgNPs/rGO) composites by heating the mixture of GO and AgNO<sub>3</sub> aqueous solution in the presence of sodium hydroxide at 80 °C under stirring. The reaction was accomplished within a short period of 10 min without extra reducing agent. As-synthesized AgNPs/rGO composites have been successfully applied in photocurrent generation in the visible spectral region. © 2012 American Chemical Society.

**Document Type:** Article



Khan, A.A.P.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Azum, N.<sup>a b</sup>, Rub, M.A.<sup>a b</sup>, Khan, A.<sup>a b</sup>, Al-Youbi, A.O.<sup>a b</sup>

## Kinetics and mechanistic investigation of decarboxylation for the oxidation of levofloxacin by chloramine-t in acidic medium

(2012) *Industrial and Engineering Chemistry Research*, 51 (13), pp. 4819-4824. Cited 1 time.

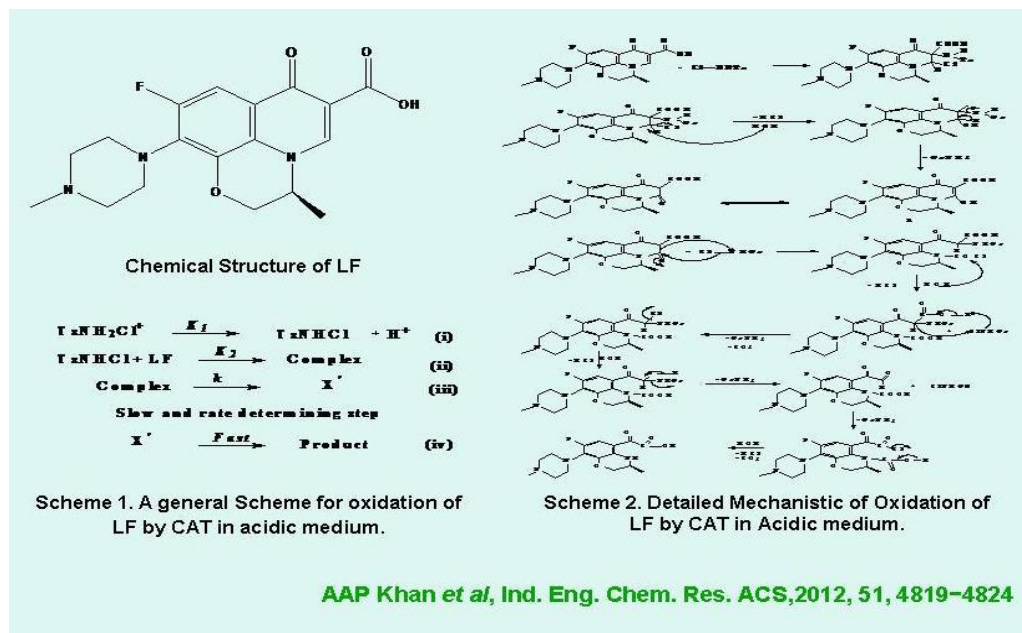
<sup>a</sup> Chemistry Department, Faculty of Science, Saudi Arabia

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### Abstract

The mechanistic investigation of oxidation of levofloxacin (LF) has been studied by chloramine-T(CAT) in aqueous perchloric acid medium at 25 °C. The reaction followed first-order kinetics with respect to [CAT], [LF], and [H<sup>+</sup>] in their lower concentrations range, tending to zero-order at their higher concentrations. First-order kinetics with respect to [CAT] was observed for the oxidation of levofloxacin. An increase in perchloric acid concentration increased the rate of reaction. The effect of added products, ionic strength, and dielectric constant of the medium was studied on the rate of reaction. The main products were identified by spot test, FT-IR, and NMR. A mechanism was proposed on the basis of experimental results. The activation parameters with respect to the slow step of the mechanism was evaluated, and the thermodynamic parameters were also determined and discussed. © 2012 American Chemical Society.

Document Type: Article



Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Sobahi, T.R.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

### **1-Phenyl-1H-pyrazole-4-carbaldehyde**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1088. Cited 1 time.

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#### **Abstract**

In the title molecule, C<sub>10</sub>H<sub>8</sub>N<sub>2</sub>O, the five- and six-membered rings form a dihedral angle of 10.14 (9)°. The aldehyde group is almost coplanar with the pyrazole ring to which it is connected [O-C-C-C torsion angle = -179.35 (17)°]. In the crystal, inversion dimers are linked by four C-H...O interactions as the carbonyl O atom accepts two such bonds. The dimeric aggregates are linked into supra-molecular layers in the ac plane by C-H...π and π-π [ring centroid(pyrrole)...ring centroid(phen-yl) = 3.8058 (10) Å] interactions.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Thabaiti, S.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**2-[(1-Methyl-1H-pyrrol-2-yl)methyl-ene]propane-dinitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1170.

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**Abstract**

In the title compound, C<sub>9</sub>H<sub>7</sub>N<sub>3</sub>, the N-bound methyl group and vinyl H atom are syn. The 12 non-H atoms comprising the molecule are essentially coplanar (r.m.s. deviation = 0.071 Å). Supra-molecular tapes feature in the crystal packing, orientated perpendicular to [10-1], and are formed by C-H...N inter-actions involving each cyano N atom. The tapes are connected into layers via  $\pi$ - $\pi$  inter-actions occurring between translationally related pyrrole rings [ring centroid-centroid distance = 3.8754 (10) Å]; the layers stack along the b axis.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Alamry, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>a</sup>

**2-(4-Sulfamoylphen-yl)hydrazin-1-ium chloride**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1140.

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**Abstract**

The hydrazinium residue in the cation of the title salt, C<sub>6</sub>H<sub>10</sub>N<sub>3</sub>O<sub>2</sub>S<sup>+</sup>·Cl<sup>-</sup>, is twisted out of the plane of the benzene ring to which it is attached [N-N-C-C torsion angle = 25.9 (2)°] and the amino group is almost perpendicular to the benzene ring [N-S-C-C torsion angle = 88.71 (16)°]. In the crystal, the cations are linked by N-H···O hydrogen bonds and π-π inter-actions [ring centroid distance = 3.7280 (11) Å], forming layers in the bc plane that are connected by N-H···Cl hydrogen bonds.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Nemari, K.F.<sup>a b</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>  
**(2E)-2-[(2H-1,3-Benzodioxol-5-yl)methyl-ene]-2,3-dihydro-1H-inden-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1015.

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### Abstract

In the title compound, C<sub>17</sub>H<sub>12</sub>O<sub>3</sub>, each of the five-membered rings in the inden-1-one and 1,3-benzodioxole residues is almost planar (r.m.s. deviations = 0.041 and 0.033 Å, respectively). A small twist about the single bond linking the two residues is evident [the C-C-C-C torsion angle = 8.7 (4)°]. Supra-molecular zigzag layers propagating in the ac plane are formed in the crystal via C-H...O inter-actions. The layers are linked via π-π inter-actions between the five- and six-membered rings of 1,3-benzodioxole residues [centroid-centroid distance = 3.4977 (14) Å].

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Nemari, K.F.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2E)-2-(Furan-2-yl-methyl-idene)-2,3-dihydro-1H-inden-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1065. Cited 1 time.

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**Abstract**

In the title compound, C<sub>14</sub>H<sub>10</sub>O<sub>2</sub>, the five-membered ring of the inden-1-one residue is almost planar (r.m.s. deviation = 0.035 Å). A twist about the single bond linking the two residues is evident [C-C-C-C torsion angle = -13.2 (5)°]. The three-dimensional architecture is stabilized by C-H...O (involving the trifurcated carbonyl O atom), C-H...π and π-π inter-actions [between the five- and six-membered rings of inden-1-one residues; ring centroid-centroid distance = 3.7983 (17) Å]. The sample studied was a non-merohedral twin; the minor component refined to approximately 36%.

**Document Type:** Article

Al-Youbi, A.O.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**3,5-Dimethyl-1-phenyl-1H-pyrazole-4-carbaldehyde**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1051.

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**Abstract**

In the title molecule, C<sub>12</sub>H<sub>12</sub>N<sub>2</sub>O, the five- and six-membered rings form a dihedral angle of 68.41 (16)°. The aldehyde group is nearly coplanar with the pyrazole ring [C-C-C-O torsion angle = -0.4 (5)°]. The three-dimensional architecture is sustained by weak C-H...O and C-H... $\pi$  interactions.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Hameed, S.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**3,6-Dimethyl-1-phenyl-1H,4H-pyrano[2,3-c]pyrazol-4-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1120. Cited 1 time.

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**Abstract**

The title compound, C<sub>14</sub>H<sub>12</sub>N<sub>2</sub>O<sub>2</sub>, is almost planar with an r.m.s. deviation for all non-H atoms of 0.038 Å. The observed planarity is rationalized in terms of a close intramolecular C-H...O inter-action. Supra-molecular layers, two mol-ecules thick and with a step topology, are formed in the crystal packing via C-H...O contacts involving the carbonyl O atom, which accepts two such bonds, and  $\pi$ - $\pi$  inter-actions between the components of the fused ring system and the phenyl ring of inversion-related mol-ecules [centroid-centroid distances = 3.6819 (13) and 3.6759 (12) Å].

**Document Type:** Article



Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Alamry, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**3-Amino-1-(3,4-dimeth-oxy-phen-yl)-9,10-dihydro-phenanthrene-2,4-dicarbonitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1118-o1119.

<sup>a</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, PO Box 80203, Jeddah, Saudi Arabia

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**Abstract**

In the title compound, C<sub>24</sub>H<sub>19</sub>N<sub>3</sub>O<sub>2</sub>, the partially saturated ring adopts a distorted half-chair conformation with the methyl-ene-C atom closest to the amino-benzene ring lying 0.664 (3) Å out of the plane defined by the five remaining atoms (r.m.s. deviation = 0.1429 Å). The dihedral angle [32.01 (10)°] between the benzene rings on either side of this ring indicates a significant fold in this part of the mol-ecule. The dimeth-oxy-substituted benzene ring is almost orthogonal to the benzene ring to which it is attached [dihedral angle = 72.03 (9)°]. The mol-ecule has been observed previously as the major component of a 1:19 co-crystal with 2-amino-4-(3,4-dimeth-oxy-phen-yl)-5,6-dihydro-benzo[ha]quinoline-3-carbonitrile [Asiri et al. (2011). *Acta Cryst.* E67, O 2873-O2873]. Supra-molecular chains with base vector [201] are formed in the crystal structure via N-H...O hydrogen bonds between the amino H atoms of one mol-ecule inter-acting with the meth-oxy O atoms of a neighbouring mol-ecule. The chains are linked into a three-dimensional architecture by C-H...π inter-actions.

**Document Type:** Article

Al-Youbi, A.O.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

### **3-Amino-1-(thio-phen-2-yl)-9,10-dihydro-phenanthrene-2,4-dicarbonitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1027-o1028. Cited 5 times.

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#### **Abstract**

In the title compound, C<sub>20</sub>H<sub>13</sub>N<sub>3</sub>S, the partially saturated ring adopts a twisted half-boat conformation with the methyl-ene C atom closest to the amino-benzene ring lying 0.690 (6) Å out of the plane defined by the five remaining atoms. The dihydro-phenanthrene residue has a folded conformation [dihedral angle between the outer benzene rings = 26.27 (18)°]. The thio-phen-2-yl ring forms a dihedral angle of 63.76 (19)° with the benzene ring to which it is attached. In the crystal, inversion dimers linked by pairs of N-H...N hydrogen bonds generate R 2 2(12) loops. The dimers are linked into layers in the bc plane by weak C-H...π inter-actions. The thio-phen-2-yl ring is disordered over two essentially coplanar but opposite orientations in a 0.918 (4):0.082 (4) ratio.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Alamry, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-[(1,3-Thia-zol-2-yl)sulfamo-yl]phenyl 2,2,2-trifluoro-acetate**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1156.

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**Abstract**

In the title compound, C<sub>11</sub>H<sub>7</sub>F<sub>3</sub>N<sub>2</sub>O<sub>4</sub>S<sub>2</sub>, the 1,3-thia-zol-2-amine residue is almost perpendicular to the central benzene ring [dihedral angle = 84.3 (2)°]. There is a small twist between the benzene ring and the ester group [C-O-C-C torsion angle = 9.8 (6)°]. Thus, the molecule has an L-shape. Inversion-related dimers are connected in the crystal packing by pairs of N-H···N hydrogen bonds formed between the amine H and thia-zole N atom via eight-membered {···HNCN}2 synthons.

**Document Type:** Article

Al-Youbi, A.O.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-{2-[(E)-Cyclo-pentyl-idene]hydrazin-1-yl}benzene-sulfonamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1196.

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**Abstract**

The title molecule, C<sub>11</sub>H<sub>15</sub>N<sub>3</sub>O 2S, features a five-membered ring which is twisted about the middle CH<sub>2</sub>-CH<sub>2</sub> bond. The benzene ring is inclined with respect to the imine residue [C-N-N-C torsion angle = 165.4 (2)°]. Supra-molecular layers in the bc plane are formed by hydrogen bonds between the amine H atoms and sulfonamide O and imine N atoms, as well as by a weak hydrazine H-atom inter-molecular interaction with the second sulfonamide O atom.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Alamry, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-[5-(Furan-2-yl)-3-trifluoro-methyl-1H-pyrazol-1-yl]benzene-sulfonamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1168-o1169.

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**Abstract**

In the title compound, C<sub>14</sub>H<sub>10</sub>F<sub>3</sub>N<sub>3</sub>O<sub>3</sub>S, there are significant twists in the molecule, as seen in the values of the dihedral angles between the pyrazole ring and each of the furan [31.1 (2)°] and benzene rings [55.58 (10)°]. The amino N atom occupies a position almost normal to the benzene ring [N-S-Car-Car (ar = aromatic) torsion angle = 83.70 (19)°]. One amino H atom forms a hydrogen bond to the tricoordinate pyrazole N atom and the other inter-acts with a sulfonamide O atom, forming a supra-molecular chain along [010]. The chains are consolidated into a supra-molecular layers via C-H...O interactions involving the second sulfonamide O atom; layers stack along [10-1]. The furan ring was found to be disordered over two diagonally opposite orientations of equal occupancy.

**Document Type:** Article

Al-Youbi, A.O.<sup>a b</sup>, Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4a-Methyl-2,3,4,4a-tetra-hydro-1H-carbazole-6-sulfonamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1050.

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**Abstract**

In the title mol-ecule, C<sub>13</sub>H<sub>16</sub>N<sub>2</sub>O 2S, the nine non-H atoms comprising the indole residue are approximately coplanar (r.m.s. deviation = 0.031 Å). The partially saturated ring adopts a chair conformation. One amine H forms an inter-molecular N-H···O hydrogen bond to a sulfonamide O atom, while the other amine H form is connected to the indole N atom of an adjacent mol-ecule via an N-H···N hydrogen bond, resulting in a three-dimensional architecture.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Sobahi, T.R.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(4Z)-4-Benzyl-idene-2-phenyl-1,3-oxazol-5(4H)-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1154.

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**Abstract**

In the title compound, C<sub>17</sub>H<sub>13</sub>NO<sub>2</sub>, the benzene ring is twisted slightly out of the plane of the oxazole ring to which it is attached [dihedral angle = 7.98 (8)°]. Similarly, there is a twist [dihedral angle = 5.50 (8)°] between the oxazole and phenyl rings that are linked via the C=C bond [1.348 (2) Å]; the conformation about the latter is Z. In the crystal, the presence of C-H⋯O, C-H⋯π and π-π inter-actions [centroid-centroid distance = 3.5259 (9) Å] link the mol-ecules into a three-dimensional architecture.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Alamry, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**A second monoclinic polymorph for 3-amino-1-(4-meth-oxy-phen-yl)-9,10-dihydro-phenanthrene-2,4-dicarbonitrile**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1157-o1158.

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**Abstract**

The title compound, C<sub>23</sub>H<sub>17</sub>N<sub>3</sub>O, has been previously described in a monoclinic P21/c polymorph with Z = 4 [Asiri, Al-Youbi, Faidallah, Ng & Tiekink (2011). *Acta Cryst. E* 67, O 2449]. In the new monoclinic P21/n form, with Z = 8, there are two independent mol-ecules, A and B, in the asymmetric unit. In both mol-ecules, the cyclohexa-1,3-diene ring has a screw-boat conformation, whereas it is a distorted half-chair in the original polymorph. There is a fold in each mol-ecule, as indicated by the dihedral angle between the benzene rings of the 1,2-dihydro-naphthalene and aniline residues of 33.19 (10)° (mol-ecule A) and 30.6 (10)° (mol-ecule B). The meth-oxy-benzene ring is twisted out of the plane of the aniline residue to which it is connected [dihedral angles = 49.22 (10) and 73.27 (10)°, in A and B respectively]. In the crystal, the two independent mol-ecules self-associate via N-H⋯N hydrogen bonds, generating a 12-membered {⋯HNC3N}<sub>2</sub> synthon. These are connected into a supra-molecular tape in the (-101) plane by N-H⋯O(meth-oxy) inter-actions. In the P21/c polymorph, supra-molecular layers are formed by N-H⋯N and N-H⋯O inter-actions.

**Document Type:** Article



Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Qin, X.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

### **A simple route for preparation of highly stable CuO nanoparticles for nonenzymatic glucose detection**

(2012) *Catalysis Science and Technology*, 2 (4), pp. 813-817. Cited 9 times.

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#### **Abstract**

Highly stable CuO nanoparticles about 2-4 nm in diameter have been successfully prepared by heating aqueous Cu(OAc)<sub>2</sub> and urea solution in the presence of poly[(2-ethyl-dimethylammonioethyl methacrylate ethyl sulfate)-co-(1-vinylpyrrolidone)] (PQ11). Direct placing of the resultant dispersion on a glassy carbon electrode (GCE) without the use of an immobilization support matrix leads to very stable CuO nanoparticle-containing films with remarkable catalytic performance toward the oxidation of glucose. This sensor shows good response to glucose in comparison to other normally co-existing electroactive species (such as dopamine, ascorbic acid and uric acid). The linear detection range is estimated to be from 5 μM to 2.3 mM ( $r = 0.994$ ), and the detection limit is estimated to be 0.5 μM at a signal-to-noise ratio of 3. More importantly, it suggests that this glucose sensor can be used for the glucose detection in human blood serum. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Chang, G.<sup>a</sup>, Luo, Y.<sup>a</sup>, Lu, W.<sup>a</sup>, Qin, X.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

**Ag nanoparticles decorated polyaniline nanofibers: Synthesis, characterization, and applications toward catalytic reduction of 4-nitrophenol and electrochemical detection of H<sub>2</sub>O<sub>2</sub> and glucose**  
(2012) *Catalysis Science and Technology*, 2 (4), pp. 800-806. Cited 19 times.

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### Abstract

Polyaniline nanofibers (PANINFs) have been facilely prepared by electrochemical polymerization of aniline monomers in acidic aqueous media without using any templates and surfactants. The subsequent treatment of such nanofibers with a AgNO<sub>3</sub> aqueous solution leads to in situ chemical reduction of Ag<sup>+</sup> on them to form Ag nanoparticles decorated PANINFs (AgNPs/PANINFs) nanocomposites. We investigated the catalytic activity and electrochemical properties of these nanocomposites. It is found that such nanocomposites exhibit excellent catalytic activity toward reduction of 4-nitrophenol to 4-aminophenol by NaBH<sub>4</sub> and exhibit remarkable catalytic performance for H<sub>2</sub>O<sub>2</sub> reduction. The enzymeless H<sub>2</sub>O<sub>2</sub> sensor constructed using the nanocomposites shows a fast amperometric response time of less than 3 s. The linear range and detection limit are estimated to be from 0.1 mM to 60 mM ( $r = 0.998$ ) and 1.7  $\mu$ M at a signal-to-noise ratio of 3, respectively. We have fabricated a glucose biosensor by immobilizing glucose oxidase into the AgNPs/PANINFs-modified glassy carbon electrode for glucose detection. This sensor exhibits good response to glucose. The linear response range is estimated to be from 1 mM to 12 mM ( $r = 0.997$ ) at -0.58 V. The detection limit is estimated to be 0.25 mM at a signal-to-noise ratio of 3. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Liu, S.<sup>a</sup>, Tian, J.<sup>a b</sup>, Wang, L.<sup>a</sup>, Sun, X.<sup>a c d</sup>

**Highly sensitive and selective colorimetric detection of Ag(I) ion using 3,3',5,5'-tetramethylbenzidine (TMB) as an indicator**

(2012) *Sensors and Actuators, B: Chemical*, 165 (1), pp. 44-47. Cited 5 times.

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**Abstract**

In this paper, we report on our recent finding that Ag<sup>+</sup> can oxidize 3,3',5,5'-tetramethylbenzidine (TMB) to develop a blue color in aqueous solution, leading to a simple approach to colorimetric detection of Ag<sup>+</sup> with a detection limit of 50 nM. Most importantly, we demonstrate its practical application to detect Ag<sup>+</sup> in real sample. © 2012 Elsevier B.V. All rights reserved.

**Author Keywords**

3,3',5,5'-Tetramethylbenzidine; Ag<sup>+</sup> ion; Colorimetric detection; Lake water; UV-vis

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Sobahi, T.R.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

## **N-(4-Sulfamoylphen-yl)acetamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1155.

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### **Abstract**

In the title compound, C<sub>8</sub>H<sub>10</sub>N<sub>2</sub>O<sub>3</sub>S, the dihedral angle between the acetamide group and the benzene ring is 15.59 (12)° and the amino group is close to being perpendicular to the benzene ring [N-S-Car-Car (ar = aromatic) torsion angle = 109.4 (2)°]. In the crystal, mol-ecules are linked into supra-molecular tubes parallel to [001] by amine-amide N-H···O inter-actions and these are connected into the three-dimensional architecture by amide-sulfonamide N-H···O hydrogen bonds. The crystal studied was a racemic twin.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Thabaiti, S.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**N-Acetyl-N-[2,4-dicyano-1-(4-meth-oxy-phen-yl)-9,10-dihydro-phenanthren-3-yl]acetamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1177-o1178.

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**Abstract**

In the title compound, C<sub>27</sub>H<sub>21</sub>N<sub>3</sub>O<sub>3</sub>, the cyclo-hexa-1,3-diene ring has a screw-boat conformation, and the fused ring system is folded, the dihedral angle between the outer benzene rings being 27.61 (6)°. The N-acetyl-acetamide residue (r.m.s. deviation = 0.0935 Å) has an anti conformation and is essentially perpendicular to the benzene ring to which it is connected [dihedral angle = 89.14 (6)°]; the meth-oxy-benzene group is also twisted out of this ring [dihedral angle = 59.47 (7)°]. The three-dimensional architecture is consolidated by C-H...O and C-H...π inter-actions.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Khan, K.A.<sup>a</sup>, Ng, S.W.<sup>a c</sup>, Tiekink, E.R.T.<sup>c</sup>

**N,N'-Bis[(E)-1-(thio-phen-3-yl)ethyl-ene]ethane-1,2-diamine**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (4), pp. o1026. Cited 2 times.

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**Abstract**

The complete molecule of the title compound, C<sub>14</sub>H<sub>16</sub>N<sub>2</sub>S<sub>2</sub>, is generated by a crystallographic inversion centre. The thio-phenylene residue is close to being coplanar with the imine group [C-C-C-N torsion angle = 6.5 (2)°], and the conformation about the imine C=N bond [1.281 (2) Å] is E. In the crystal, the three-dimensional architecture is consolidated by C-H⋯N, C-H⋯π and S⋯S [3.3932 (7) Å] inter-actions.

**Document Type:** Article

El-Shishtawy, R.M.<sup>a</sup>, Salam, M.A.<sup>a</sup>, Gabal, M.A.<sup>a</sup>, Asiri, A.M.<sup>a,b</sup>

**Preparation, characterization and electromagnetic properties of polyaniline/carbon nanotubes/nickel ferrite nanocomposites**

(2012) *Polymer Composites*, 33 (4), pp. 532-539.

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**Abstract**

New electromagnetic nanocomposites were prepared from polyaniline (PANI)/oxidized single-walled carbon nanotubes (OxSWCNTs)/NiFe<sub>2</sub>O<sub>4</sub> by in situ polymerization of aniline using hexanoic acid as a soft template. OxSWCNT and NiFe<sub>2</sub>O<sub>4</sub> were prepared first so as to be used in the formulation of PANI composites. Transmission electron microscope (TEM) results revealed the formation of PANI nanoparticles of 60 nm diameter, OxSWCNT of 24 nm, and NiFe<sub>2</sub>O<sub>4</sub> of 54 nm. Also, TEM image of the ternary composite indicated agglomerative coating of PANI appearing as a gray shells and black core of NiFe<sub>2</sub>O<sub>4</sub> with widening the diameter of OxSWCNT to be around 66 nm. Dc conductivity was measured as a function of temperature. Magnetic susceptibility was measured as a function of temperature and magnetic field intensity. All samples revealed NiFe<sub>2</sub>O<sub>4</sub>-dependent ferromagnetism. The activation energies for dc conductivity suggest that the conductivity is owing to hopping conduction mechanism. A synergistic effect between NiFe<sub>2</sub>O<sub>4</sub> and PANI/OxSWCNT is observed. © 2012 Society of Plastics Engineers.

**Document Type:** Article

Marwani, H.M.<sup>a b</sup>, Albishri, H.M.<sup>a</sup>, Soliman, E.M.<sup>a</sup>, Jalal, T.A.<sup>a</sup>

**Selective adsorption and determination of hexavalent chromium in water samples by chemically modified activated carbon with tris(hydroxymethyl)aminomethane**

(2012) *Journal of Dispersion Science and Technology*, 33 (4), pp. 549-555. Cited 3 times.

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**Abstract**

This study introduces a sensitive and simple method for selective adsorption of hexavalent chromium, Cr(VI), from water samples prior to its determination by inductively coupled plasma optical emission spectrometry (ICP-OES). The method utilized activated carbon modified with tris(hydroxymethyl)aminomethane (AC-TRIS) as an adsorbent. Surface properties of the new chemically modified AC-TRIS phase were confirmed by Fourier transform infrared (FTIR) spectroscopy. Seven metal ions, including Co(II), Cu(II), Ni(II), Pb(II), Cr(III), Cr(VI), and Fe(III) were evaluated and determined at different pH values (1.0-8.0), except for Fe(III) at pH values (1.0-4.0). Based on the results of the effect of pH on adsorption of these metal ions on AC-TRIS, Cr(VI) was selected for the study of other parameters controlling its maximum uptake on AC-TRIS under batch conditions and at the optimum pH value 1.0. The maximum static adsorption capacity of Cr(VI) onto the AC-TRIS was found to be 43.30 mg g<sup>-1</sup> at this pH and after 1 hour contact time. The adsorption data of Cr(VI) were modeled using both Langmuir and Freundlich classical adsorption isotherms. Results demonstrated that the adsorption of Cr(VI) onto AC-TRIS followed a pseudo second-order kinetic model. In addition, the efficiency of this methodology was confirmed by applying it to real environmental water samples. © 2012 Copyright Taylor and Francis Group, LLC.

**Author Keywords**

Adsorption; batch method; Cr(VI); ICP-OES; modified activated carbon; tris(hydroxymethyl)aminomethane

**Document Type:** Article



Chang, G.<sup>a</sup>, Luo, Y.<sup>a</sup>, Lu, W.<sup>a</sup>, Qin, X.<sup>a</sup>, Liao, F.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

## **Single-stranded DNA-based Immobilization of Ag nanoparticles for enzymeless H<sub>2</sub>O<sub>2</sub> Detection**

(2012) *Current Nanoscience*, 8 (2), pp. 292-298.

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### **Abstract**

In this communication, we report a new method for effective immobilization of Ag nanoparticles (AgNPs) on thiolated singlestranded DNA (thiol-ssDNA) modified Au electrode (AuE) surface via coordination interactions between the nitrogen atoms of DNA bases and AgNPs. It suggests that the AgNP-immobilized AuE exhibits notable catalytic performance for H<sub>2</sub>O<sub>2</sub> reduction and the loading of AgNPs on the AuE surface and therefore the effective catalytic area can be tuned by the immobilization time of thiol-ssDNA and adsorption time of AgNPs. This H<sub>2</sub>O<sub>2</sub> sensor has a fast amperometric response time of less than 3 s and its linear range and detection limit are estimated to be from 0.1 mM to 160 mM ( $r = 0.995$ ) and 0.8  $\mu$ M at a signal-to-noise ratio of 3, respectively. © 2012 Bentham Science Publishers.

### **Author Keywords**

Ag nanoparticle; Enzymeless H<sub>2</sub>O<sub>2</sub> detection; Immobilization; Thiolated single-stranded DNA

**Document Type:** Article

Qin, X.<sup>a</sup>, Liu, S.<sup>a</sup>, Lu, W.<sup>a</sup>, Li, H.<sup>a</sup>, Chang, G.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Submicrometre-scale polyaniline colloidal spheres:  
Photopolymerization preparation using fluorescent carbon nitride  
dots as a photocatalyst**

(2012) *Catalysis Science and Technology*, 2 (4), pp. 711-714. Cited 6 times.

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**Abstract**

The present communication reports on a novel synthesis of submicrometre-scale polyaniline colloidal spheres (PANICSs) using fluorescent carbon nitride dots (CNDs) as a photocatalyst for the first time. The subsequent treatment of such colloidal spheres with an aqueous AgNO<sub>3</sub> solution produces Ag nanoparticles (AgNPs) decorated PANICSs (AgNPs-PANICSs) composites. Such composites exhibit remarkable catalytic performance toward catalytic reduction of 4-nitrophenol and electrochemical reduction of H<sub>2</sub>O<sub>2</sub>. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Lu, W.<sup>a b</sup>, Luo, Y.<sup>a b</sup>, Chang, G.<sup>a b</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a b c d</sup>

**Supramolecular microfibrils of o-phenylenediamine dimers:  
Oxidation-induced formation of Au nanoparticle-decorated  
nanoplates for H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Current Nanoscience*, 8 (2), pp. 221-225. Cited 1 time.

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**Abstract**

The direct mix of aqueous FeCl<sub>3</sub> and o-phenylenediamine (OPD) solutions at room temperature leads to supramolecular microfibrils of OPD dimers generated by the oxidation of OPD monomers by FeCl<sub>3</sub>. In this paper, we demonstrate that the subsequent treatment of such microfibrils with a H<sub>2</sub>AuCl<sub>4</sub> aqueous solution leads to Au nanoparticle (AuNP)-decorated nanoplates. The possible formation mechanism involved is also discussed. It is found that such nanocomposites can effectively catalyze both oxidation and reduction of H<sub>2</sub>O<sub>2</sub>. The sensor constructed with these nanocomposites exhibits a fast amperometric response time of less than 4 s. The linear detection range is estimated to be from 100 μM to 170 mM (r=0.997), and the detection limit is estimated to be 8 μM at a signal-to-noise ratio of 3. © 2012 Bentham Science Publishers.

**Author Keywords**

Au nanoparticle; H<sub>2</sub>O<sub>2</sub> detection; Nanoplate; Supramolecular microfibril

**Document Type:** Article

Zhang, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Liu, S.<sup>a</sup>, Wang, L.<sup>a</sup>, Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Chang, G.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Novel application of CoFe layered double hydroxide nanoplates for colorimetric detection of H<sub>2</sub>O<sub>2</sub> and glucose**

(2012) *Analyst*, 137 (6), pp. 1325-1328. Cited 6 times.

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**Abstract**

The present communication demonstrates the proof of concept of using CoFe layered double hydroxide (CoFe-LDHs) nanoplates as an effective peroxidase mimetic to catalyze the oxidation of peroxidase substrate 3,3',5,5'-tetramethylbenzidine in the presence of H<sub>2</sub>O<sub>2</sub> to produce a blue solution. We further demonstrate successfully CoFe-LDHs nanoplate-based colorimetric assay to detect H<sub>2</sub>O<sub>2</sub> and glucose. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, El-Hallag, I.S.<sup>a c</sup>, Al-Youbi, A.O.<sup>b</sup>, Alamry, K.A.<sup>b</sup>, Khan, S.A.<sup>b</sup>

**Electrochemical properties of 4-[(Anthracen-9-ylmethylene)-amino]-1, 5-dimethyl-2-phenyl-1,2-dihydro-pyrazol-3-one at a platinum electrode in acetonitrile solvent**

(2012) *Journal of New Materials for Electrochemical Systems*, 15 (2), pp. 113-121.

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**Abstract**

The electrochemical properties of 4-[(anthracen-9-ylmethylene)-amino]-1, 5-dimethyl-2-phenyl-1,2-dihydro-pyrazol-3-one have been carried out using cyclic voltammetry and convolution-deconvolution voltammetry combined with digital simulation technique at a platinum electrode in 0.1 mol/L tetraethyl ammonium chloride (TEACl) in solvent acetonitrile (CH<sub>3</sub>CN). In switching the potential to positive scan, the compound was oxidized by loss of one electron forming radical cation followed by fast chemical step and the radical cation loss another two electrons producing trication which followed by chemical reaction (ECEEC). The investigated compound was reduced via consumption of two consecutive electrons to form radical anion followed by fast chemical step and the radical anion gain another electron to form dianion followed by chemical step (ECEC mechanism). The electrode reaction pathway and the chemical and electrochemical parameters of the investigated compound were determined using cyclic voltammetry, convolutive voltammetry and chronoamperometry. The Electrochemical data such as  $a$ ,  $k$ ,  $s$ ,  $E_o$ ,  $D$ , and  $k_c$  of the investigated pyrazole derivative were evaluated experimentally and verified via digital simulation technique. Electrochemical behaviour of the pyrazole compound under consideration was presented and discussed. © J. New Mat. Electrochem. Systems.

**Author Keywords**

1,5-dimethyl-2-phenyl-1,2-dihydro-pyrazol-3-one; Convolutive voltammetry; Cyclic voltammetry; Digital simulation

**Document Type:** Article

Zhang, Y.<sup>a</sup>, Liu, S.<sup>a</sup>, Wang, L.<sup>a</sup>, Luo, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

## **Novel use of poly(3,4-ethylenedioxythiophene) nanoparticles for fluorescent nucleic acid detection**

(2012) *ACS Combinatorial Science*, 14 (3), pp. 191-196.

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### **Abstract**

In this paper, we demonstrate the novel use of poly(3,4-ethylene dioxythiophene) (PEDOT) nanoparticle as a very effective fluorescent sensing platform for the detection of nucleic acid sequences. The principle of the assay lies in the fact that the adsorption of the fluorescently labeled single-stranded DNA (ssDNA) probe by PEDOT nanoparticle leads to substantial fluorescence quenching, followed by specific hybridization with the complementary region of the target DNA sequence. This results in desorption of the hybridized complex from PEDOT nanoparticle surface and subsequent recovery of fluorescence. A detection limit as low as 30 pM could be achieved in this sensing system. We also demonstrate its application for multiplexed detection of nucleic acid sequences. Furthermore, this sensing system can realize the detection of single-base mismatch even in multiplexed format. It is of importance to note that the successful use of this sensing platform in human blood serum system is also demonstrated. © 2012 American Chemical Society.

### **Author Keywords**

blood serum; fluorescent; nanoparticles; nucleic acid detection; poly(3,4-ethylenedioxythiophene)

**Document Type:** Article

Hussein, M.A.<sup>a b</sup>, Asiri, A.M.<sup>a c</sup>

## **Organometallic ferrocene- and phosphorus-containing polymers: Synthesis and characterization**

(2012) *Designed Monomers and Polymers*, 15 (3), pp. 207-251. Cited 1 time.

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### **Abstract**

The inclusion of organometallic units into polymeric structures has attracted much attention in different fields according to the nature and behaviour of the inserted metal. Moreover, the discovery of organometallic polymers and their structural characterization initiated an explosive rebirth of organometallic chemistry. Organometallic moieties are in or pendent to the polymer backbone and examine some of the uses of the emergent metallocene polymers, and new uses are still being found for these remarkable organometallic moieties. This review gives a simple introduction to variable organometallic molecules and their characteristics. This review will focus on the syntheses and characterization of organometallic polymers, including ferrocene- and phosphorus-containing polymers. A general overview on ferrocene polymers with a special attention to ferrocene-containing liquid crystalline polymers (including a ferrocene moiety in the main chain, side-chain or dendrimers) and fullerene-ferrocene liquid crystalline polymers is presented. In addition, more details for synthesis and properties of phosphorus-containing polymers are illustrated. © 2012 Koninklijke Brill NV, Leiden.

### **Author Keywords**

characterization; Ferrocene; organometallic polymers; phosphorus; synthesis

**Document Type:** Article

Lu, S.<sup>a b</sup>, Jin, T.<sup>c</sup>, Bao, M.<sup>a</sup>, Asiri, A.M.<sup>d e</sup>, Yamamoto, Y.<sup>c</sup>

**Palladium-catalyzed bisfunctionalization of active alkenes by  $\beta$ -acetonitrile- $\alpha$ -allyl addition: Application to the synthesis of unsymmetric 1,4-di(organo)fullerene derivatives**

(2012) *Tetrahedron Letters*, 53 (10), pp. 1210-1213.

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**Abstract**

A new, efficient palladium-catalyzed bisfunctionalization of ethylidene malononitriles by addition of acetonitrile and allyl groups is developed for the construction of all-carbon quarternary and tertiary centers simultaneously. This methodology is successfully applied to the synthesis of unsymmetric 1,4-disubstituted C 60. © 2012 Elsevier Ltd. All rights reserved.

**Author Keywords**

$\beta$ -Acetonitrile- $\alpha$ -allyl addition; All-carbon quarternary center; Bisfunctionalization of active alkenes; Unsymmetric 1,4-disubstituted C 60

**Document Type:** Article



Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Nemari, K.F.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2E)-2-[(2E)-3-Phenylprop-2-en-1-yl-idene]-2,3-dihydro-1H-inden-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o814. Cited 2 times.

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**Abstract**

The title inden-1-one derivative, C<sub>18</sub>H<sub>14</sub>O, is planar with an r.m.s. deviation for all 19 non-H atoms of 0.098 Å. The conformation about each of the C=C bonds [1.343 (3) and 1.349 (3) Å] is E. Supra-molecular layers in the bc plane, mediated by C - H...O and π-π [ring centroid-centroid distance = 3.5282 (15) Å] inter-actions, feature in the crystal packing.

**Author Keywords**

data-to-parameter ratio = 8.8; mean  $\sigma$ (C-C) = 0.004 Å; R factor = 0.042; single-crystal X-ray study; T = 100 K; wR factor = 0.101

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Al-Nemari, K.F.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2E)-2-(4-Bromobenzylidene)-2,3-dihydro-1H-inden-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o755. Cited 2 times.

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**Abstract**

The title indan-1-one derivative, C<sub>16</sub>H<sub>11</sub>BrO, is planar, the r.m.s. deviation for all 18 non-H atoms being 0.071 Å. The configuration about the C=C bond [1.337 (5) Å] is E. In the crystal, supra-molecular layers in the ab plane are formed by C - H $\cdots$ O interactions, involving the bifurcated carbonyl O atom, as well as C - H $\cdots$  $\pi$  inter-actions. The studied crystal was an inversion twin.

**Author Keywords**

data-to-parameter ratio = 16.5; mean  $\sigma$ (C-C) = 0.005 Å; R factor = 0.036; single-crystal X-ray study; T = 100 K; wR factor = 0.068

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>b</sup>, Al-Nemari, K.F.<sup>a b</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2E)-2-(4-Methoxybenzylidene)-2,3-di-hydro-1H-inden-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o815.

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**Abstract**

In the title compound, C<sub>17</sub>H<sub>14</sub>O<sub>2</sub>, the indan-1-one system is almost planar (r.m.s. deviation = 0.007 Å) and the benzene ring is twisted out of its plane by 8.15 (6)°. The conformation about the C=C double bond [1.348 (2) Å] is E. Helical supra-molecular chains along [010] feature in the crystal packing; these are sustained by C - H···O hydrogen bonds and π-π inter-actions between translationally related indan-1-one systems [centroid-centroid distance = 3.7970 (10) Å].

**Author Keywords**

data-to-parameter ratio = 16.2; mean σ(C-C) = 0.002 Å; R factor = 0.049; single-crystal X-ray study; T = 100 K; wR factor = 0.126

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Al-Youbi, A.O.<sup>a</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2Z)-1-(5-Hydroxy-3-methyl-1-phenyl-1H-pyrazol-4-yl)-3-(4-methylanilino)-but-2-en-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o794. Cited 2 times.

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**Abstract**

A twist is evident in the title compound, C 21H 21N 3O 2, the dihedral angle between the terminal six-membered rings being 29.46 (10)°; the linked five- and six-membered rings are coplanar [1.30 (11)°]. The carbonyl O atom accepts intra-molecular hydrogen bonds from the adjacent hydroxy and amine groups. The three-dimensional crystal packing is achieved through C - H... $\pi$  inter-actions.

**Author Keywords**

data-to-parameter ratio = 16.5; mean  $\sigma$ (C-C) = 0.003 Å; R factor = 0.060; single-crystal X-ray study; T = 100 K; wR factor = 0.164

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2Z)-3-(3-Bromoanilino)-1-(5-hydroxy-3-methyl-1-phenyl-1H-pyrazol-4-yl) but-2-en-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o813.

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**Abstract**

In the title compound, C<sub>20</sub>H<sub>18</sub>BrN<sub>3</sub>O<sub>2</sub>, the central carbonyl group forms amine-N - H $\cdots$ O and hydroxy-O - H $\cdots$ O hydrogen bonds, which lead to two fused S(6) rings. The N-bound phenyl ring is coplanar with the five-membered ring to which it is attached [dihedral angle = 5.22 (18) $^\circ$ ], but the dihedral angle [33.87 (17) $^\circ$ ] between the terminal phenyl and bromo-benzene rings indicates an overall twist in the molecule. In the crystal packing, molecules assemble into dimeric aggregates via C - H $\cdots$  $\pi$  interactions.

**Author Keywords**

data-to-parameter ratio = 16.5; mean  $\sigma$ (C-C) = 0.005 Å; R factor = 0.047; single-crystal X-ray study; T = 100 K; wR factor = 0.105

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**(2Z)-3-(4-Fluoroanilino)-1-(5-hydroxy-3-methyl-1-phenyl-1H-pyrazol-4-yl) but-2-en-1-one**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o764. Cited 2 times.

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**Abstract**

The central carbonyl group in the title compound, C<sub>20</sub>H<sub>18</sub>FN<sub>3</sub>O<sub>2</sub>, forms amine-hydroxy N - H $\cdots$ O and hydroxy-hydroxy O - H $\cdots$ O hydrogen bonds, leading to two S(6) rings. The N-bound phenyl ring is coplanar with the five-membered ring to which it is attached [dihedral angle = 6.27 (10) $^\circ$ ], but an overall twist in the molecule is evident, the dihedral angle between the terminal phenyl and benzene rings being 27.30 (10) $^\circ$ . Molecules aggregate into a three-dimensional architecture via C - H $\cdots$ F, C - H $\cdots$ O and C - H $\cdots$  $\pi$  interactions.

**Author Keywords**

data-to-parameter ratio = 15.8; mean  $\sigma$ (C-C) = 0.003 Å; R factor = 0.055; single-crystal X-ray study; T = 100 K; wR factor = 0.123

**Document Type:** Article

Asiri, A.M.<sup>a b</sup>, Faidallah, H.M.<sup>a</sup>, Ng, S.W.<sup>c</sup>, Tiekink, E.R.T.<sup>c</sup>

**4-[(4Z)-4-[(2Z)-3-(4-Fluoroanilino)-1-hydroxybut-2-en-1-ylidene]-3-methyl-5-oxo-4,5-dihydro-1H-pyrazol-1-yl]-benzene-sulfonamide**

(2012) *Acta Crystallographica Section E: Structure Reports Online*, 68 (3), pp. o762-o763. Cited 6 times.

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**Abstract**

In the title compound, C<sub>20</sub>H<sub>19</sub>FN<sub>4</sub>O<sub>4</sub>S, the pyrazole and benzene-sulfonamide rings are coplanar [dihedral angle = 5.02 (15)°] but this planarity does not extend over the entire molecule, the dihedral angle between the terminal six-membered rings being 33.24 (14)°. Intra-molecular hydroxy-hydroxy O - H...O and amine-hydroxy N - H...O hydrogen bonds, as well as a tight C - H...O(carbon-yl) interaction, lead to a sequence of three fused S(6) rings. Supra-molecular chains along the a axis feature in the crystal packing; these chains are stabilized by amine-sulfonamide N - H...O and amine-pyrazole N - H...N hydrogen bonds.

**Author Keywords**

data-to-parameter ratio = 14.8; mean  $\sigma$ (C-C) = 0.004 Å; R factor = 0.059; single-crystal X-ray study; T = 100 K; wR factor = 0.146

**Document Type:** Article

Al-Zain, Y.<sup>a</sup>, Sato, Y.<sup>a</sup>, Kim, H.Y.<sup>a</sup>, Hosoda, H.<sup>b</sup>, Nam, T.H.<sup>c</sup>, Miyazaki, S.<sup>a c d</sup>

## **Room temperature aging behavior of Ti-Nb-Mo-based superelastic alloys**

(2012) *Acta Materialia*, 60 (5), pp. 2437-2447.

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### **Abstract**

The effect of room temperature (RT) aging on the superelasticity of Ti-Nb-Mo-based superelastic alloys is investigated. The results show that annealing at relatively low temperatures such as 973 K after severe cold rolling results in poor resistance to the effect of RT aging. The transformation stress increases considerably due to the formation of an isothermal  $\omega$  phase at RT. Addition of Sn is partially effective in suppressing the RT aging effect in the specimens annealed at 973 K. The RT aging effect is suppressed by increasing the annealing temperature, due to the annihilation of lattice defects or non-equilibrium vacancies introduced during cold rolling, which are responsible for accelerating the diffusion process, however, superelasticity is reduced by annealing at higher temperatures, due to a decrease in the critical stress for slip deformation ( $\sigma_{CSS}$ ). The specimen annealed at 1173 K followed by aging at 773 K exhibits stable superelasticity with a high resistance to the effect of RT aging. Annealing at 1173 K causes the annihilation of lattice defects or non-equilibrium vacancies, while aging at 773 K induces precipitation of the  $\alpha$  phase, which in turn causes an increase in  $\sigma_{CSS}$ , and further enhances the resistance to the RT aging effect by enriching the matrix with  $\beta$ -stabilizing elements. © 2012 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.

### **Author Keywords**

Martensitic transformation; Omega phase; Shape memory alloys; Ti-Nb

**Document Type:** Article



El-Daly, S.A.<sup>a c</sup>, Asiri, A.M.<sup>a b</sup>, Alamry, K.A.<sup>a</sup>, Hussein, M.A.<sup>a d</sup>

## **Synthesis and spectral properties of 4-(2,5-dimethoxyphenylmethelene)-2- phenyl-5-oxazolone (DMPO)**

(2012) *Chinese Journal of Chemistry*, 30 (3), pp. 563-569.

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### **Abstract**

An interesting flourophore, 4-(2,5-dimethoxyphenylmethelene)-2-phenyl-5- oxazolone (DMPO) was synthesized by mixing an equivalent molar quantity of hippuric acid and 2,5-dimethoxybenzaldehyde in acetic anhydride in the presence of anhydrous sodium acetate. The absorption and fluorescence characteristics of 4-(2,5-dimethoxyphenylmethelene)-2-phenyl-5-oxazolone (DMPO) were investigated in different solvents. DMPO dye exhibits red shift in both absorption and emission spectra as solvent polarity increases, indicating change in the dipole moment of molecules upon excitation due to an intramolecular charge transfer interaction. The fluorescence quantum yield depends strongly on the properties of the solvents, which was attributed to positive and negative solvatokinetic effects. A crystalline solid of DMPO gave strong excimer like emission at 630 nm due to the excitation of molecular aggregates. This is expected from the idealized crystal structure of the dye that belongs to the B-type class of Steven's Classification. DMPO displayed fluorescence quenching by triethylamine via nonemissive exciplex formation. © 2012 SIOC, CAS, Shanghai, & WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

### **Author Keywords**

4-(2,5-dimethoxy-phenylmethelene)-2-phenyl-5-oxazolone (DMPO); effect of medium; fluorescence quantum yield; solid state emission

**Document Type:** Article

Al-Sehemi, A.G.<sup>a</sup>, Irfan, A.<sup>a</sup>, Asiri, A.M.<sup>b,c</sup>

## **The DFT investigations of the electron injection in hydrazone-based sensitizers**

(2012) *Theoretical Chemistry Accounts*, 131 (3), pp. 1-10. Cited 4 times.

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### **Abstract**

Quantum chemical calculations were carried out by using density functional theory and time-dependant density functional theory at B3LYP/6-31G(d) and TD-B3LYP/6-31G(d) level of theories. The absorption spectra have been computed with and without solvent. The calculated absorption spectra in ethanol, acetonitrile, and methanol are in good agreement with experimental evidences. The absorption spectra are red shifted compared to System1. On the basis of electron injection and electronic coupling constant, we have shed light on the nature of different sensitizers. The coplanarity between the benzene near anchoring group having LUMO and the bridge (N-N) is broken in System6 and System7 that would hamper the recombination process. The electron injection of System2-System10 is superior to System1. The highest electronic coupling constant has been observed for System6 that followed the System7 and System8. The light-harvesting efficiency of all the sensitizers enlarged in acetonitrile and ethanol. The long-range-corrected functional (LC-BLYP), Coulomb-attenuating method (CAM-B3LYP), and BH and HLYP functional underestimate the excitation energies while B3LYP is good to reproduce the experimental data. Moreover, we have investigated the effect of cyanoacetic acid as anchoring group on the electron injection. © 2012 Springer-Verlag.

### **Author Keywords**

Absorption; Density functional theory; Dye-sensitized solar cells; Electron injection; Time-dependant density functional theory

**Document Type:** Article

Teng, Z.<sup>a</sup>, Zheng, G.<sup>a</sup>, Dou, Y.<sup>a</sup>, Li, W.<sup>a</sup>, Mou, C.-Y.<sup>b</sup>, Zhang, X.<sup>c d</sup>, Asiri, A.M.<sup>e</sup>, Zhao, D.<sup>a</sup>

## **Highly ordered mesoporous silica films with perpendicular mesochannels by a simple stöber-solution growth approach**

(2012) *Angewandte Chemie - International Edition*, 51 (9), pp. 2173-2177. Cited 7 times.

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### **Abstract**

A simple solution: In the simple approach to silica films with perpendicular mesochannels presented herein, the substrate is immersed into a Stöber solution in which the silica precursors are hydrolyzed, cross-linked by an ammonia catalyst, and assembled with a surfactant on the substrate to form hexagonal mesostructures perpendicular to the substrate surface. Copyright © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

### **Author Keywords**

mesoporous materials; perpendicular channels; silica; Stöber solution; thin films

**Document Type:** Article

Ferrara, G.<sup>a,b</sup>, Jin, T.<sup>a</sup>, Oniwa, K.<sup>b</sup>, Zhao, J.<sup>b</sup>, Asiri, A.M.<sup>c,d</sup>, Yamamoto, Y.<sup>a</sup>

## **Synthesis of new donor-acceptor-donor materials via Au-catalyzed double cascade cyclization**

(2012) *Tetrahedron Letters*, 53 (8), pp. 914-918. Cited 2 times.

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### **Abstract**

A new class of symmetric  $\pi$ -conjugated donor-acceptor-donor (D-A-D) materials, with aryl- or heteroaryl[a]annulated carbazole (AHA[a]C) moieties as the donors and with 2,1,3-benzothiadiazole (BT) as an acceptor, has been synthesized via NaAuCl<sub>4</sub> catalyzed double cascade cyclization of arenyl tetraynes in ethanol in good to high yields. Photophysical and electrochemical properties of the new D-A-D materials were investigated. © 2011 Elsevier Ltd. All rights reserved.

### **Author Keywords**

Aryl- and heteroaryl-annulated carbazoles; Benzothiadiazole; Donor-acceptor-donor material; Double cascade cyclization; Gold catalysis

**Document Type:** Article

Tian, J.<sup>a b</sup>, Liu, S.<sup>a</sup>, Li, H.<sup>a</sup>, Wang, L.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**One-step preparation of ZnO nanoparticle-decorated reduced graphene oxide composites and their application to photocurrent generation**

(2012) *RSC Advances*, 2 (4), pp. 1318-1321. Cited 5 times.

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**Abstract**

In this communication, we develop a facile, one-step strategy towards the rapid synthesis of ZnO nanoparticle-decorated reduced graphene oxide (rGO-ZnO) composites by directly immersing Zn plate in a GO solution containing ammonia with the aid of ultrasonication at room temperature. The rGO-ZnO composites obtained have applications in photocurrent generation in the visible spectral region of white light using zinc porphyrin (ZnP) as a photosensitizer. © 2012 The Royal Society of Chemistry.

**Document Type:** Article

Qin, X.<sup>a</sup>, Lu, W.<sup>a</sup>, Luo, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

**Synthesis of Ag nanoparticle-decorated 2,4,6-tris(2-pyridyl)-1,3,5-triazine nanobelts and their application for H<sub>2</sub>O<sub>2</sub> and glucose detection**

(2012) *Analyst*, 137 (4), pp. 939-943. Cited 10 times.

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**Abstract**

The present paper reports on the first preparation of 2,4,6-tris(2-pyridyl)-1,3,5-triazine nanobelts (TPTNBs) by adjusting the pH value of the solution and the subsequent synthesis of Ag nanoparticle (AgNP)-decorated TPTNBs (AgNP-TPTNBs) by mixing an aqueous AgNO<sub>3</sub> solution with preformed TPTNBs without use of any external reducing agent. It is found that the resultant AgNP-TPTNBs exhibit notable catalytic performance for H<sub>2</sub>O<sub>2</sub> reduction. A glucose biosensor was fabricated by immobilizing glucose oxidase (GOD) onto a AgNP-TPTNBs-modified glassy carbon electrode (GCE) for glucose detection. The constructed glucose sensor has a wide linear response range from 3 mM to 20 mM (r: 0.999) with a detection limit of 190 μM. It is further shown that this glucose biosensor can be used for glucose detection in human blood serum. © The Royal Society of Chemistry 2012.

**Document Type:** Article

Ibrahim, M.<sup>a</sup>, El-Barbary, A.A.<sup>b</sup>, El-Nahass, M.M.<sup>b</sup>, Kamel, M.A.<sup>b</sup>, El-Mansy, M.A.M.<sup>b</sup>, Asiri, A.M.<sup>c d</sup>

**On the spectroscopic analyses of (E)-3-(dicyclopropyl methylene)-dihydro-4- [1-(2,5 dimethylfuran-3-yl) ethylidene]furan-2,5-dione**

(2012) *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 87, pp. 202-208. Cited 6 times.

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**Abstract**

In this work, a combined experimental and theoretical study on molecular structure and vibrational frequencies of (E)-3-(dicyclopropyl methylene)-dihydro-4-[1-(2,5 dimethylfuran-3-yl) ethylidene] furan-2,5-dione [DCPF] were reported. The FT-IR spectra of DCPF isomers are recorded in the solid phase. The equilibrium geometries, harmonic vibrational frequencies, thermo-chemical parameters, total dipole moment and HOMO-LUMO energies are calculated by density functional theory DFT/B3LYP utilizing 6-311G(d,p) basis set. Results showed that scaled frequencies are in good agreement with experimental values. The HOMOs and the LUMOs energies of DCPF isomers were 3.8 and 2.7 eV for E and C isomers, respectively. © 2011 Elsevier B.V.

**Author Keywords**

DCPF; FT-IR, DFT; HOMO-LUMO energies; Vibrational analysis

**Document Type:** Article

Hussein, M.A.<sup>a,b</sup>, Asiri, A.M.<sup>a,c</sup>, Aly, K.I.<sup>b</sup>

## **New polyamides and polyoxazoles based on diphenyl ether segments in the polymers' backbone**

(2012) *International Journal of Polymeric Materials and Polymeric Biomaterials*, 61 (2), pp. 154-175. Cited 1 time.

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<sup>c</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah, Saudi Arabia

### **Abstract**

Two new series of polyamides, 7a-e and polyoxazoles 8 a-e, containing diphenyl ether segments were synthesized using a low-temperature solution of polycondensation and polycyclization reactions, respectively. Polyamides were synthesized by interaction of monomer 4 with different aliphatic and aromatic diacid chlorides, including adipoyl, sebacoyl, oxaloyl, 4,4-azodibenzoyl and 3,3-azodibenzoyl dichlorides. The polymerization reaction was carried out in dry DMF as a solvent and in the presence of anhydrous potassium carbonate as a catalyst at room temperature. Polyoxazoles were obtained as cyclization products from corresponding polyamides in polyphosphoric acid. The model compounds 5 and 6 were synthesized to know the optimum polymerization procedures. The structure of the model compounds as well as the resulting polymers was characterized by elemental and spectral analyses. The synthesized polymers were soluble in protonic solvents such as formic and concentrated sulfuric giving different colors. The thermal properties of those polymers were evaluated by TGA, DTG, and DTA measurements and correlated to their structural units. FDT for polyamides was nearly complete at around 730-750°C, while for polyoxazoles it was nearly complete at around 580-650°C. The glass transition temperatures for the selected polymers were in the range of 47-74°C, while T<sub>m</sub> values were in the range of 156-315°C. X-ray analysis showed that the selected polyamides have a higher degree of crystallinity than polyoxazoles in the region 2θ=5-60°. In addition, the morphological properties of selected examples were tested by SEM measurements. A comparative SEM study was carried out between selected polyamides and polyoxazoles. © 2012 Copyright Taylor and Francis Group, LLC.

### **Author Keywords**

characterization; diphenyl ether; morphological properties; polyamides; polyoxazoles; synthesis; thermal analysis

**Document Type:** Article



Zhang, Y.<sup>a</sup>, Luo, Y.<sup>a</sup>, Tian, J.<sup>a b</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

**Rectangular coordination polymer nanoplates: Large-scale, rapid synthesis and their application as a fluorescent sensing platform for DNA detection**

(2012) *PLoS ONE*, 7 (1), art. no. e30426, . Cited 2 times.

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<sup>c</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

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**Abstract**

In this paper, we report on the large-scale, rapid synthesis of uniform rectangular coordination polymer nanoplates (RCPNs) assembled from Cu(II) and 4,4'-bipyridine for the first time. We further demonstrate that such RCPNs can be used as a very effective fluorescent sensing platform for multiple DNA detection with a detection limit as low as 30 pM and a high selectivity down to single-base mismatch. The DNA detection is accomplished by the following two steps: (1) RCPN binds dye-labeled single-stranded DNA (ssDNA) probe, which brings dye and RCPN into close proximity, leading to fluorescence quenching; (2) Specific hybridization of the probe with its target generates a double-stranded DNA (dsDNA) which detaches from RCPN, leading to fluorescence recovery. It suggests that this sensing system can well discriminate complementary and mismatched DNA sequences. The exact mechanism of fluorescence quenching involved is elucidated experimentally and its use in a human blood serum system is also demonstrated successfully. © 2012 Zhang et al.

**Document Type:** Article

Qian, X.F.<sup>a</sup>, Li, B.<sup>a</sup>, Hu, Y.Y.<sup>a</sup>, Niu, G.X.<sup>a</sup>, Zhang, D.Y.H.<sup>a</sup>, Che, R.C.<sup>a</sup>, Tang, Y.<sup>a</sup>, Su, D.S.<sup>b,c</sup>, Asiri, A.M.<sup>d</sup>, Zhao, D.Y.<sup>a</sup>

## Exploring meso-/microporous composite molecular sieves with core-shell structures

(2012) *Chemistry - A European Journal*, 18 (3), pp. 931-939. Cited 11 times.

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### Abstract

A series of core-shell-structured composite molecular sieves comprising zeolite single crystals (i.e., ZSM-5) as a core and ordered mesoporous silica as a shell were synthesized by means of a surfactant-directed sol-gel process in basic medium by using cetyltrimethylammonium bromide (CTAB) as a template and tetraethylorthosilicate (TEOS) as silica precursor. Through this coating method, uniform mesoporous silica shells closely grow around the anisotropic zeolite single crystals, the shell thickness of which can easily be tuned in the range of 15-100 nm by changing the ratio of TEOS/zeolite. The obtained composite molecular sieves have compact meso-/micropore junctions that form a hierarchical pore structure from ordered mesopore channels (2.4-3.0 nm in diameter) to zeolite micropores ( $\approx 0.51$  nm). The short-time kinetic diffusion efficiency of benzene molecules within pristine ZSM-5 ( $\approx 7.88 \times 10^{-19}$  m<sup>2</sup> s<sup>-1</sup>) is almost retainable after covering with 75 nm-thick mesoporous silica shells ( $\approx 7.25 \times 10^{-19}$  m<sup>2</sup> s<sup>-1</sup>), which reflects the greatly opened junctions between closely connected mesopores (shell) and micropores (core). The core-shell composite shows greatly enhanced adsorption capacity ( $\approx 1.35$  mmol g<sup>-1</sup>) for large molecules such as 1,3,5-triisopropylbenzene relative to that of pristine ZSM-5 ( $\approx 0.4$  mmol g<sup>-1</sup>) owing to the mesoporous silica shells. When Al species are introduced during the coating process, the core-shell composite molecular sieves demonstrate a graded acidity distribution from weak acidity of mesopores (predominant Lewis acid sites) to accessible strong acidity of zeolite cores (Lewis and Brønsted acid sites). The probe catalytic cracking reaction of n-dodecane shows the superiority of the unique core-shell structure over pristine ZSM-5. Insight into the core-shell composite structure with hierarchical pore and graded acidity distribution show great potential for petroleum catalytic processes. Esprit de core: Meso-/microporous core-shell composite molecular sieves with hierarchical pore structures (see figure), from opened mesopore channels (2.4-3.0 nm) to accessible micropores ( $\approx 0.51$  nm), and graded acidity distributions, from weakly acidic mesopores to accessible strongly acidic ZSM-5 cores, have been synthesized. Copyright © 2012 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim.

### Author Keywords

composite materials; core-shell structures; mesoporous materials; molecular sieves; zeolites

**Document Type:** Article

Ning, R.<sup>a b</sup>, Lu, W.<sup>a</sup>, Zhang, Y.<sup>a</sup>, Qin, X.<sup>a</sup>, Luo, Y.<sup>a</sup>, Hu, J.<sup>c</sup>, Asiri, A.M.<sup>d e</sup>, Al-Youbi, A.O.<sup>d e</sup>, Sun, X.<sup>a d e</sup>

## **A novel strategy to synthesize Au nanoplates and their application for enzymeless H<sub>2</sub>O<sub>2</sub> detection**

(2012) *Electrochimica Acta*, 60, pp. 13-16. Cited 8 times.

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<sup>e</sup> Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

### **Abstract**

The present communication reports a novel and simple strategy to synthesize Au nanoplates (AuPs) by heating an aqueous solution of HAuCl<sub>4</sub> in the presence of poly [(2-ethyltrimethylammonioethyl methacrylate ethyl sulfate)-co-(1-vinylpyrrolidone)] (PQ11). Direct placing of the resultant dispersion on a glassy carbon electrode (GCE) surface gives a very stable AuPs-containing film exhibiting remarkable catalytic performance toward both the oxidation and reduction of H<sub>2</sub>O<sub>2</sub>. This enzymeless H<sub>2</sub>O<sub>2</sub> sensor shows a fast amperometric response time of less than 3 s and the corresponding linear range and detection limit are estimated to be from 0.1 mM to 50 mM ( $r = 0.999$ ) and 4  $\mu$ M at a signal-to-noise ratio of 3, respectively. © 2011 Elsevier Ltd. All rights reserved.

### **Author Keywords**

Au nanoplate; Enzymeless; Hydrogen peroxide detection; PQ11

**Document Type:** Article

Liu, S.<sup>a</sup>, Wang, L.<sup>a</sup>, Tian, J.<sup>a b</sup>, Luo, Y.<sup>a</sup>, Chang, G.<sup>a</sup>, Asiri, A.M.<sup>c d</sup>, Al-Youbi, A.O.<sup>c d</sup>, Sun, X.<sup>a c d</sup>

## **Application of zeolitic imidazolate framework-8 nanoparticles for the fluorescence-enhanced detection of nucleic acids**

(2012) *ChemPlusChem*, 77 (1), pp. 23-26.

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### **Abstract**

tranded on a nanoparticle: For the first time, zeolitic imidazolate framework-8 nanoparticles (ZIFNPs) have been used in an effective fluorescent sensing platform for nucleic acids. The DNA detection is accomplished in two steps: 1) ZIFNPs adsorb and quench the dye-labeled single-stranded DNA probe, and 2) subsequent hybridization of the probe with its target produces double-stranded DNA, which detaches from the ZIFNP. The present system shows a high selectivity down to single-base mismatch (see figure). © 2012 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

### **Author Keywords**

Fluorescence; Nanoparticles; Nucleic acid detection; Sensors; Zeolitic imidazolate frameworks

**Document Type:** Article

Wang, L.<sup>a</sup>, Qin, X.<sup>a</sup>, Liu, S.<sup>a</sup>, Luo, Y.<sup>a</sup>, Asiri, A.M.<sup>b c</sup>, Al-Youbi, A.O.<sup>b c</sup>, Sun, X.<sup>a b c</sup>

**Single-stranded DNA-mediated immobilization of graphene on a gold electrode for sensitive and selective determination of dopamine**

(2012) *ChemPlusChem*, 77 (1), pp. 19-22. Cited 1 time.

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**Abstract**

Chemically modified electrodes: The fast and effective immobilization of graphene on a Au electrode has been demonstrated by exploiting Au-S interactions between Au and a thiolated single-stranded DNA as well as  $\pi$ - $\pi$  stacking interactions between graphene and DNA bases (see figure). The resultant modified electrode exhibits high sensitivity and selectivity in dopamine detection with a detection limit of 0.8 nM in the presence of ascorbic acid. © 2012 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

**Author Keywords**

DNA; Dopamine detection; Graphene; Modified electrodes; Pi interactions

**Document Type:** Article

Khan, S.A.<sup>a</sup>, Asiri, A.M.<sup>a b</sup>, Saleem, K.<sup>c</sup>

**Synthesis and biological evaluation of new' oxime-ether derivatives of steroid as anti-bacterial agents**

(2012) *Journal of Saudi Chemical Society*, 16 (1), pp. 7-11.

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**Abstract**

Various oxime-ether derivatives of cholesterol have been synthesized by the alkylation of the steroidal oxime with 1-(2-chloroethyl) pyrrolidine hydrogen chloride/chloroethylamine hydrochloride in the presence of sodium methoxide in dry methanol. The structures of these compounds were elucidated by IR 1H NMR, FAB mass spectroscopic methods and elemental analyses. The anti-bacterial activity was first tested in vitro by the disk diffusion method against two Gram-positive and two Gram-negative bacteria, and then the minimum inhibitory concentration (MIC) of compounds were determined. The results showed that the chloro derivatives exhibited better anti-bacterial activity than the standard drug chloramphenicol. © 2010.

**Author Keywords**

Anti-bacterial activity; Chloramphenicol; Cholesterol; Oxime-ether

**Document Type:** Article

## Author Index (2012)

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