ELECTROCHEMISTRY

Test bank -chapter 19

1	If the following equation is properly balanced with the smallest whole-number coefficients, what is the coefficient of Bi^{3+}? $$Mn^{2+}(aq) + BiO_3^-(aq) \rightarrow MnO_4^-(aq) + Bi^{3+}(aq)$$ a) 1 b) 2 c) 3 d) 5
2	Given the following notation for an electrochemical cell, what is the balanced overall (net) cell reaction $Pt(s) \mid H2(g) \mid H+(aq) \mid\mid Ag+(aq) \mid Ag(s$ a) $H^+(aq) + 2Ag^+(aq) \rightarrow H_2(g) + 2Ag(s)$ b) $H_2(g) + 2Ag^+(aq) \rightarrow 2H^+(aq) + 2Ag(s)$ c) $H_2(g) + Ag^+(aq) \rightarrow H^+(aq) + Ag(s)$
3	A certain electrochemical cell has for its cell reaction, Which is the half-reaction occurring at the anode? $Zn + HgO \rightarrow ZnO + Hg$ a) $HgO + 2e^- \rightarrow Hg + O^{2-}$ b) $Zn^{2+} + 2e^- \rightarrow Zn$ c) $Zn \rightarrow Zn^{2+} + 2e^-$ d) $ZnO + 2e^- \rightarrow Zn$
4	Calculate the value of E°cell for the following reaction $2Au(s) + 3Ca^{2+}(aq) \rightarrow 2Au^{3+}(aq) + 3Ca(s)$, If $E^0 Au^{3+}/Au = 1.5V$ and $E^0 Ca^{2+} = -2.9V$ a) -4.37 V b)-1.37V c) + 4.37 d) – 11.6
5	Which statement is true in regard to a spontaneous redox reaction? a) E°red is always negative b) E°cell is always positive c)E°ox is always positive d) E°red is always positive
6	Determine the equilibrium constant, K, for the reaction: $2Br^-(aq) + I_2(s) \leftrightarrow Br_2(g) + 2I^-(aq)$ a) $5.3\ 10^{-19}$ b)18.30 c) 1.9×10^{18} d) 18.3×10^{-19}
7	Calculate the cell emf for the following reaction _Ni(s) + 2Cu$^+$ (0.010 M) $\rightarrow$ Ni^{2+} (0.0010 M) + 2Cu(s) If $E^0 Ni^{++}/Ni = -0.25$ $E^0 Cu^+/Cu = +0.521$ a) 0.40 V b) -0.43 V c) 0.27 V d) 0.37 V

8	8-A metal object is to be gold-plated by an electrolytic procedure using aqueous $AuCl_3$ electrolyte. Calculate the number of moles of gold deposited in 3.0 min by a constant current of 10 A
	a) 6.2×10^{-3} mol $\qquad$ b) 9×10^{-3} mol $\qquad$ c) 1.8×10^{-2} mol $\qquad$ d) 160 mol

9	How many grams of nickel would be electroplated by passing a constant current of 7.2 A through a solution of NiSO4 for 90.0 min?
	a) 0.20 g $\qquad$ b) 0.40 g $\qquad$ c)11.8g $\qquad$ d) 24g

10	How many minutes would be required to electroplate 25.0 grams of chromium by passing a constant current of 4.8 amperes through a solution containing $CrCl_3$?
	a)483 min. $\qquad$ b) 161min. $\qquad$ c)322min. $\qquad$ d)1112min.

11	Which of the following is the strongest oxidizing agent?
	$MnO_4^- + 4H^+ + 3e- \leftrightarrow MnO_2 + 2H_2O \qquad E° = 1.68$ V
	$I2 + 2e- \leftrightarrow 2I^- \qquad E° = 0.54$ V
	$Zn2+ + 2e- \leftrightarrow Zn \qquad E° = -0.76$ V
	a) $MnO_4^- \qquad$ b) $I_2 \qquad$ c) $Zn^{2+} \qquad$ d)Zn

12	Which of the following is the best reducing agent?
	$Cl_2 + 2e- \leftrightarrow 2Cl^- \qquad E° = 1.36$ V
	$Mg^{2+} + 2e- \leftrightarrow Mg \qquad E° = -2.37$ V
	$2H^+ + 2e- \leftrightarrow H_2 \qquad E° = 0.00$ V
	a) $Cl_2 \qquad$ b) $H_2 \qquad$ c) Mg $\qquad$ d) Mg^{2+}