

تقدير الجرعة الممتصة من العناصر المشعة الطبيعية في بعض عينات مياه الشرب ومياه الآبار في المنطقة
الغربية بالمملكة العربية السعودية

إعداد

المستخلص

Al	Fe	K	Na	Mg	Ca	:	ppb	ppm
			U	Pb	Hg	Cs	Bi	
-		40-	232-	226-	_238-		:	/
-	226-	238-						137
		(DWC)						228

WHO

^{238}U , ^{226}Ra , ^{228}Ra

17 10-7 7-2 2-1 :

0.1 mSv/y

Approximation the Absorbed Dosage From Natural Radionuclides in Some Drinking Water and Well Samples in Western Province of K.S.A.

Ahlan Mohammed Ali AL-Qulaiti AL-Amri

Abstract

Water is the main source of life so determination of the quality, the chemical, the radiological and the microbial contents, is one of the most important aims to mankind.

In this work, 25 samples of water were collected from wells in different areas of the Western province of the Kingdom of Saudi Arabia from Tabouk north to Abha south, as well as samples of bottled & tap water locally used in Jeddah, are analyzed for the content of the following elements in ppm & ppb: Calcium (Ca), Magnesium (Mg), Sodium (Na), Potassium (K), Iron (Fe), Aluminum (Al), Bismuth (Bi), Cesium (Cs), Mercury (Hg), Lead (Pb) and Uranium (U), by atomic absorption spectrometer. Also gamma spectrometer based on HP Ge crystal was used to determine concentrations in Bq/l of the natural radionuclides: Uranium-238, Radium-226 series, Thorium-232 series and Potassium-40 in addition to man-made Cesium-137. Then the results were compared with limits given by the World Health Organization (WHO) to identify samples which are acceptable to be used for drinking purposes to that needs chemical treatment.

The concentrations obtained by both atomic absorption spectrometer & HP Ge spectrometer showed that most of the samples need treatment to reduce concentrations of different elements, especially radioactive elements. The annual doses were calculated to check the quality of drinking water for radioactive content. The doses were determined from ^{226}Ra , ^{228}Ra , ^{238}U for the following age groups : $\leq 1\text{y}$, 1-2 y, 2-7 y, 7-10 y and $> 17\text{y}$. Most of the samples exceeded the annual limit of dose allowed by WHO (0.1 mSv/y) for all radionuclides in drinking water.