

Estimation of uranium concentration in building stones used in Jordanian buildings

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Materials derived from rock and soil such as building stones contain mainly natural various quantities of uranium (U) that cause a biological risk on the human beings.

The aim of this work was to determine the concentrations and isotopic compositions of uranium in Jordanian natural building stones samples for safeguards purposes. The collected building stone samples, include five types used mainly in the Jordanian buildings, were analyzed using inductively coupled plasma-mass spectrometry ICP-MS in addition to gamma spectrometry. The main advantage of using ICP-MS technique is that it allows a direct determination of the U concentration, while requiring little sample preparation. Also, gamma spectrometry was used to obtain the relative concentrations ratios of $^{235}\text{U}/^{238}\text{U}$. The measured (U) concentrations were ranged from $(0.477 \pm 0.057)\text{ppm}$ to $(4.092 \pm 0.413)\text{ppm}$, and the obtained $^{235}\text{U}/^{238}\text{U}$ ratios from gamma spectrometry does not exceed 0.15.

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