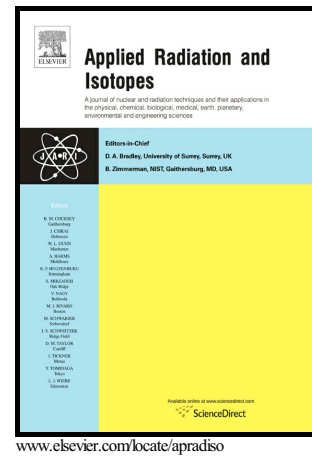


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NEW APPROACH FOR RELEASING URANIUM RADIATION IMPACT ON SHALE CONTENT EVALUATION IN SHALY SAND FORMATIONS: A CASE STUDY, EGYPT

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PII: S0969-8043(18)30230-6
DOI: <https://doi.org/10.1016/j.apradiso.2018.08.002>
Reference: ARI8444

To appear in: *Applied Radiation and Isotopes*

Received date: 7 March 2018
Revised date: 21 July 2018
Accepted date: 4 August 2018

Cite this article as: Muhammad Nabih and Ibrahim M. Al-Alfy, NEW APPROACH FOR RELEASING URANIUM RADIATION IMPACT ON SHALE CONTENT EVALUATION IN SHALY SAND FORMATIONS: A CASE STUDY, EGYPT, *Applied Radiation and Isotopes*, <https://doi.org/10.1016/j.apradiso.2018.08.002>

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NEW APPROACH FOR RELEASING URANIUM RADIATION IMPACT ON SHALE CONTENT EVALUATION IN SHALY SAND FORMATIONS: A CASE STUDY, EGYPT

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Abstract

The total shale volume is a physical parameter that plays a vital role in the evaluation of oil-bearing reservoirs. This study presents a new approach of shale volume calculation using the gamma ray spectrum of only thorium and potassium, avoiding the effect of uranium on gamma ray log (U-free). The calculations of shale volume based on U-free gamma ray log decreased to about 76%, 78%, and 79%, respectively, compared to the calculations based on the total gamma ray in clastic reservoirs in the abovementioned three regions.

A new equation was derived to calculate the shale volume in the case of the absence of spectral gamma ray logs. A good agreement was observed between the computed shale volume using (U-free) gamma ray logs and that obtained from the derived equation; showing a variable percentage of 100%, 99%, and 101% of three studied regions in Egypt (Gulf of Suez, Western Desert, and Nile Delta), respectively.

To achieve a good quality assurance of this method, the actual shale volumes of rock samples, which were estimated by the hydrometer separation technique, were compared with the calculated values using the new method. A strong correlation was found between them with a correlation coefficient r of 0.93.

Key words (U-free gamma ray log; Spectral gamma ray log; Computed shale volume; Predicted shale volume).

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