

Radiological Peculiarities of “Sandstone” Type Uranium Deposits in Uzbekistan and South Kazakhstan

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Radiology analysis of more than 30 “sandstone” uranium deposits in Mesozoic-Cenozoic sediments of Central Kyzylkum and Syrdarya uranium-ore provinces allows to predict already in reconnaissance stage correction factors necessary for quantitative uranium estimation by gamma logging.

Radioactive radon-radium equilibrium is always broken while drilling through ore intervals in permeable rocks due to pressing out from the borehole radon-bearing waters by drilling fluid (“radon pressing out” effect). That causes decreasing gamma-radiation (ore interval parameters). Correlation between drilling fluid pressure in ore intervals and values of the radon pressing out correction factor was found. For ore emanating coefficient of 22-36% and pressure excess of $P=10$ atmospheres, the correction factor is 1.12, for $P=25$ the correction is 1.30.

The diagram of boundary radium concentration created from the side of gray (non-oxidized) rocks is practically the same for all deposits considered. Possibility to use this diagram to correct influence of radium halos in boundary of ore intervals in interpretation of gamma logging was proven. Similar diagram from the side of oxidized rock also can be used, and the error in quantitative estimation of ore intervals by gamma logging does not exceed 3%.

Correlation between radioactive equilibrium coefficients in ore bodies on one hand and filtration coefficients in ore-bearing horizons with percent ratios between U^{+4} and U^{+6} in ore on another hand. The relationships can be used in radiological zone identifications in deposits.