

Geochemical dispersion associated with uranium deposits in sandstone roll front type and its relationship to the Orinoco Oil Belt, Venezuela

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In Venezuela, there is a potential for the formation of uranium deposits in areas such as the Guiana Shield, south of Eastern basin, the Andes, the massif of Baúl, among other areas. Especially great interest is the exploration of uranium redox interface type (roll front), in areas such as the southern part of the Orinoco oil belt, north and northwest of the Guiana Shield, where groundwater uranium collecting the weathering shield flowing northward in the sandstones and mudstones of the Cretaceous to Quaternary formations, which constitute the southern boundary of the Eastern basin Venezuela. The presence of gas, extra-heavy crude oil, bitumen and lignite of the Orinoco Oil Belt can be an effective barrier for uranium in solution, which may have precipitated at the redox interface of this groundwater. This process certainly was more effective before the Orinoco river take its course to the east and the waters of small rivers and large draining shield contributed to uranium aquifers became more deep north.

This work was based on a qualitative model describing geochemical dispersion associated with uranium deposits in sandstone, roll front type, which indicates that the daughter isotopes ^{238}U , which can migrate extensively are: ^{222}Rn , ^4He , and smaller proportion: ^{226}Ra and ^{222}Rn daughters (^{214}Bi , ^{210}Pb). The main exploration methods were established, which can be applied in areas of the Orinoco Oil Belt, north of the Guiana Shield, and areas west of this, among the most important are: soil measurements of radon and helium near faults, sampling soils with gamma spectrometry analysis, log interpretation of oil wells in the area of interest to establish gamma –lithological anomalies, ground water analysis of uranium, radon, radium, helium, vanadium, selenium, molybdenum, analysis of samples oil drilling cores to locate anomalous stratigraphic levels.

This research will provide the basis to establish methodologies for uraniferous exploration in the region of the Orinoco oil belt in Eastern basin Venezuela, which is an area with potential for formation of uranium deposits in sandstone, similar to Powder River basin in Wyoming and, deposits in South Texas, United States, Chu-Saryisu deposit, Kazakhstan and deposits in the San Jorge basin, Argentina, which can be considered energy basins.

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