Geophysical Research Abstracts
Vol. 12, EGU2010-363, 2010
EGU General Assembly 2010

Sedimentological setting and formation models of some uranium-bearing sandstones in Iran

Khalil Rezaei (1), Ali Larki Harchegani (2), and Nasibeh Moumsaz (2)
(1) Iran, Tehran, Tarbiat Moallem University, Dep. Geology, (khalil.rezaei@tmu.ac.ir), (2) Esfahan Azad University

In order to distinguish of genesis of uranium-bearing sandstones, we perform a several stages investigation on sandstones during geological map of Iran. Secondly, we considered conditions of their formation way in different places, separately. We distinguished several models and process. The models that explain the formation of these sedimentary rocks and stages of the complex process of U mineralization treat: the primary sources and mobility of the uranium, and accessory metals from the parent rocks to their deposition in host rocks and the post-mineral change in ore bodies. In some places, a geochemical barrier zone was identified in the sedimentary rocks that contained uranium mineral ore. These geochemical barrier areas included crescent-shaped, flat-lens, or vein-like ore bodies. The U-containing mineral described is comparable with those from the relatively common fissure-filling uranium minerals found around the world. High-resolution study of some sedimentary cycles and depositional systems tracts indicates that the fine sediments around the boundaries of parasequences can form the confining beds of uranium metallogenetic fluid systems. The braided channel sandstones and part large-scale braided distributary's channel sandstones have a close relationship with strong interlayer oxidation and uranium mineralization. Periodical development of parasequences conduces to the frequent growth of large skeletal sandstones and confining beds. That is the essential reason for the complexity of uranium mineralization in depositional systems tracts. The study also found that different depositional systems lead to obvious differences in the spatial distribution structures of skeletal sandstones and confining beds. LST and HST mainly comprise braided stream depositional systems, where uranium skeletal sandstones develop and are always located in the middle and lower parts of the parasequences, while confining beds are always located in the upper part of parasequences. While EST mainly comprises braided delta depositional systems, where uranium skeletal sandstones have a relatively small scale and are always located in the middle part of parasequences, confining beds are always located in the lower and upper parts of parasequences. Also, the environmental transport of uranium is strongly influenced by its chemical form. It is generally one of the more mobile radioactive metals and can move down through soil with percolating water to underlying groundwater. Uranium preferentially adheres to soil particles and concentration ratios are usually much higher for clay soils. Thus, the study of depositional systems tracts in sequence is only suitable for the primary exploration stage of sandstone-type uranium deposits, and parasequences are the best evaluation units in the advanced exploration stage.