

REE geochemical study on Dongsheng sandstone uranium deposit, Inner Mongolia, China

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Abstract: Dongsheng sandstone uranium is located in northern Ordos Basin and the mineralization is controlled by gray-green sandstone which is unlike the typical interlayer oxidation zone metallogenic model. Based on the previous study, this paper systematically summarized the REE geochemical characteristics of this uranium deposits and discussed the REE geochemical behavior during the water-rock reflected process. The REE composition, relationship and the genesis studies on surrounding rock, mineralization sandstone and the uranium ore found a positive correlation between REE and U, indicating uranium mineralization. There were similar but different among the shape of REE curve of all kinds rock which indicates that they have same diagenetic environment, but fluids, formatted in different grade uranium ore, have different origins and evolution. The elements equipotential line studies show that REE exhibited different activity during different mineralization which can be divided into two processes: one is the formation of low-grade uranium ore which has weak REE activity and the other is the formation of high-grade uranium ore which has significantly enhanced REE activity. Combined with Ce and Eu anomalies and REE mobility features, the paper considers that uranium mineralization fluid in the region was mainly groundwater with low temperature and alkaline characteristics. REE mainly migrated in the form of $[REE(CO_3)_3]^{3-}$. The PH, Eh and reduce of temperature and pressure were important factors leading to the precipitation of U and REE.

Keywords: Ordos Basin; Dongsheng sandstone uranium deposit; REE; geochemistry behavior; water-rock reflection