

**Effects of groundwater flow field
characteristics on uranium
mineralization in Yili Basin**

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The redox cycle controls uranium conversion between groundwater and sediment, while groundwater dynamic conditions control the migration of uranium in aquifers. The coupling of hydrodynamic and geochemistry controls both the migration and transformation and the location of mineralization in aquifers system of sedimentary basin. The characteristics of the groundwater flow field determine the overall pattern of the redox environment in the aquifer system at different geological periods, and then control the spatial distribution of uranium mineralization and uranium deposit. Taking the Yili Basin as an example, hydrogeological conceptual model of the Yili Basin was established basing on the analysis of the lithology, structure and tectonic features of aquifers. Uranium reaction-migration model was used to simulate uranium migration and transformation in the basin aquifers system. The simulation results reveal the redox zoning characteristics and uranium mineralization positions in the aquifers formed at different geological period. The results can provide hydrogeological theoretical basis and quantitative analysis tools for evaluating uranium mineralization, metallogenic location and potential scale in sedimentary basins.