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The uranium enrichment of hydrothermal sedimentary rocks of lower Cretaceous in Baiyinchagan sag of Erlian basin, Inner Mongolia^①

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The lower Cretaceous hydrothermal sedimentary rocks had been found in Baiyinchagan sag of Inner Mongolia Erlian basin in recent years^[1-3]. The hydrothermal sedimentary rock can also be characterized by its log response with extremely high GR (Gr=700~1100API) (Fig.1), which is 2-10 times that of natural gamma value of normal argillaceous, there is a good correlation between high GR and U, the uranium content can reach to 244ppm by trace element, there is a particular uranium enrichment in the hydrothermal sedimentary. That is an interesting geological phenomenon and is worth further study.

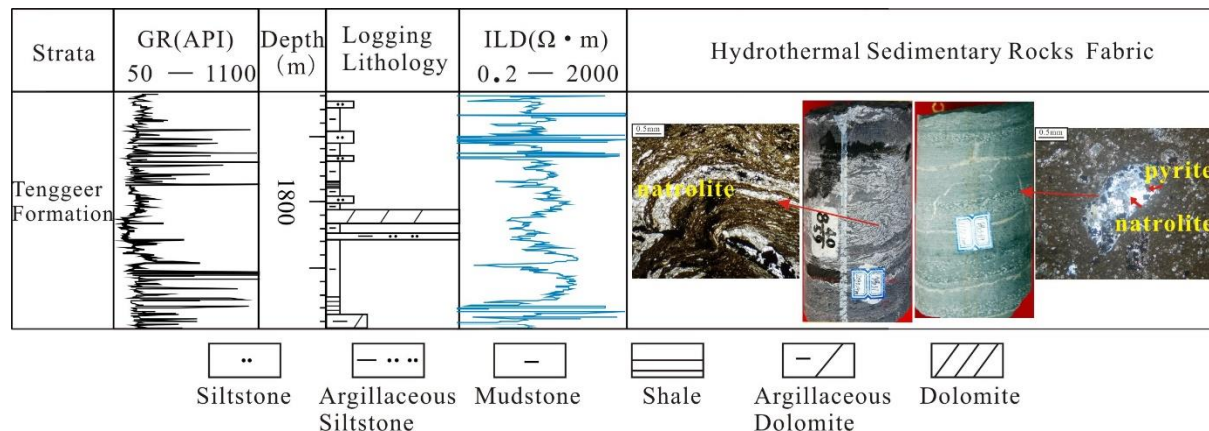


Figure 1: The high GR and the fabric of hydrothermal sedimentary rocks in Baiyinchagan Sag

Based on the well drilling data, geophysical logging, thin section, core as well as geochemical data in Erlian Basin. By using a variety of instrumental techniques including petrographic microscope, SEM, electron probe microanalysis, X-radiography and trace-element analysis. the hydrothermal sedimentary is confirmed by analysis of petrologic, mineralogy and distribution of this sets of sedimentary rock as well as structure and deposition setting^[4]. (1) In the early Cretaceous, the sedimentary rock formation in the strong rift extension and the high geothermal anomaly setting. (2) the sedimentary rock was rich in special mineral including clay sized albite, ankerite, natrolite, etc as the characteristic, which only limited in semideep-deep lacustrine facies. (3) the sedimentary rock is controlled by NE-trending synsedimentary faults and distributed mainly in downthrown side of fault Zone in northern steep slope zone and southern ramp zone adjacent to the central part in this sag. (4) the sedimentary rock is to iron dolomite as primarily, and paragenetic mineral (natrolite, feldspars, barite, franquanite, etc) symbiosis, its structure can be divided into: micrite structure, microcrystalline structure, fine-medium grained porphyritic structure (Multivariate mineral assemblage). (5) the sedimentary rock also has the obvious rock fabric characteristics of hydrothermal sedimentary^[5] (Fig.1), including lamellar structure, hydrothermal clastic texture, starrily structure, contemporaneous plasticity deformation, net vein structure. (6) A complete hydrothermal process consists of three stages: early overflow process, jet flow process and sluggish overflow stage with extremely high GR response.

References:

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