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## Natural analogue study using U, Th, REEs to identify the pragmatic hydrogeological structure in sedimentary rock

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U, Th and REEs abundances in sedimentary rocks were analyzed to understand the long-term mobility of these elements and to develop the evaluation method of the pragmatic solutes transport path at Horonobe area, Japan. The abundances of U, Th and REEs in rock matrix were generally homogeneous suggesting that no large-scale movement occurred in spite of distinct hydro-chemical condition in the sedimentary rocks. The detail analysis of peculiar points such as fracture and fault as a possible solutes transport path shows the accumulation and leaching of U, Th and REEs at some faults with connection and continuousness at specific depth. The fault and accompanied alteration possibly facilitates to leach and move the heavy-REEs (HREEs) from primary rock. Then those elements seem to have a tendency to concentrate into carbonate mineral vein in the fracture. The some clay-rich fault parts enriches in U, Th and light to medium-REEs (LREE~MREEs) compared with background rock. The clay minerals in the fault would entrap those elements and delay its transport though the fault can become a solutes transport path. From the viewpoint of solutes transport, remarkable transport path is fracture and fault (fracture media) rather than rock matrix (porous media) in sedimentary rocks at the area. Analysis of the heterogeneity of analogue elements around fault (fracture) is efficient method for the screening of pragmatic solutes transport path from the innumerable faults and fractures.

Keywords: horonobe area, sedimentary rock, solute transport path, natural analogue, rare earth element