

Biogenic redox front formation and related secondary elemental migration in sedimentary rock

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Redox reaction and front formation are effective function of contaminant retardation by the geological environment surrounding underground waste disposal, e.g. geological disposal of high level radioactive waste (HLW), but long-term process for nuclide migration and/or fixation along fractures in sedimentary rocks has received relatively little attention. Here, we describe a fixation process of secondary elements along a groundwater-conducting fracture in a Tertiary tuffaceous sedimentary sequence in Japan. It is characterized with Fe, Mn oxides bands and highly concentrated major and trace elements. Direct examinations with EPMA, SEM-EDS, and microbial studies have been carried out to characterize the microscopic geochemical nature, as well as the effect of microbial activity on matrix diffusion in sedimentary rock and the results will be presented.