



Formation of Hydrothermal nontronite associated with microbial activity at the South Atlantic Ridge

Kaiwen Ta, Xiaotong Peng, Shun Chen, Hengchao Xu, Jiwei Li, Lei Jiang, and Mengran Du
Sanya Institute of Deep Sea Science and Engineering, Chinese Academy of Sciences(xtpeng@sidsse.ac.cn)

Nontronite is an ubiquitous clay minerals in marine sediments, microbial mediation of hydrothermal nontronite have been increasing. The deposits collected from Southern Atlantic Ridge were very friable with an obvious laminated to stromatolitic to highly porous structure, varying from red, black to light yellow indicate redox condition may undergo range from micro-oxidizing to reducing. Although microbial activity are revealed to play an important role in the formation of clay minerals in sediment, little is currently known about microbial communities that reside in nontronite associated with hydrothermal activity. Here, we used Scanning electron microscopy (SEM), high-resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), nano secondary ion mass spectrometer (nanoSIMS) and molecular techniques to focus on potential mediation role of microbial in the nontronite formation of low-temperature hydrothermal deposits in South Atlantic Mid-ocean ridge. Our data suggest that the presences of abundant lamellar nontronite structures, as well as microbe-like mineralized morphologies similar to consistent with a biogenic origin. Nontronite in the lower zone of Fe-Mn oxyhydroxides are inferred to have been suboxic environment and their formation appear to be significantly controlled by the locus of redox conditions.

Keywords: Nontronite, Microbial activity, Hydrothermal deposits, Biogenic origin.