

Speciation Analysis of Iron in Natural Ochreous Sediment by Mössbauer Spectrometry

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Abstract. Speciation analysis of iron in natural ochreous sediments is performed by the help of hyperfine interactions between the nucleus and electronic shell. For this purpose, ⁵⁷Fe Mössbauer spectrometry at 300 K, 4.2 K and in external magnetic field of 6 T is employed. Sample of spontaneously precipitated ochreous sediment from an abandoned antimony mine was studied. Superparamagnetic behavior, characteristic for small particles, was revealed with random orientation of spins even after the application of external magnetic field at 4.2 K. This implies a lack of mutual cooperation of magnetic moments due to absence of long-range magnetic ordering.