

Separation of ferromagnetic components by analyzing the hysteresis loops of remanent magnetization

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Abstract

© 2015, Pleiades Publishing, Ltd. The new method is suggested for separating ferromagnetic components in sediments through analyzing the coercivity spectra of the samples by the continuous wavelet transform with the Gaussian-based wavelet (MHAT). A total of 1056 samples of Lake Khuvsgul's sediments (Mongolia) are studied. At least four groups of magnetic components are identified based on the analysis of their magnetization and remagnetization curves. Almost all samples are found to contain two components of bacterial origin which are represented by the assemblages of the interacting single-domain grains and differ by the grain compositions (magnetite and greigite). The applicability of the magnetic data for diagnosing magnetotactic bacteria in sediments and building paleoecological and paleoclimatic reconstructions is demonstrated.

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Keywords

biogenic magnetic minerals, bottom sediments, coercivity spectrum, component analysis, greigite, Lake Khuvsgul, magnetite, remanent magnetization