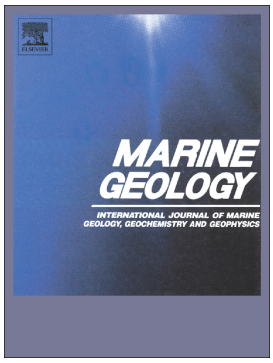

Magnetostratigraphic and environmental implications of greigite (Fe_3S_4) formation from Hole U1433A of the IODP Expedition 349, South China Sea

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Magnetostratigraphic and environmental implications of greigite (Fe_3S_4) formation from Hole U1433A of the IODP Expedition 349, South China Sea

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Abstract

A detailed magnetic analysis has been done on sedimentary core of the International Ocean Discovery Program (IODP) Site U1433A during Leg 349 in the South China Sea (SCS). Results show that dominant carriers of the natural remanent magnetization are greigite and (titano) magnetite. The major shift in both declination and inclination at ~185 mbsf is assigned to the Matuyama-Brunhes reversal boundary (~0.773 Ma). Constrained by biostratigraphic ages, variations in magnetic parameters of the core can be well correlated to the marine oxygen isotope record at glacial/interglacial cycles. Low values of concentration-dependent magnetic parameters correspond to the interglacials, and vice versa. During the interglacial periods, the dominant magnetic minerals are detrital (titano) magnetite and have relatively coarser grain sizes, while fine-grained greigites dominate the glacial periods. This indicates that during the glacials, greigite prevails at the anoxic condition with amount of terrigenous iron oxide caused by the disconnection between the SCS and the Indian Ocean and the exposure of shelf, but digenesis is suppressed at the opposite environment by the high sea level (interglacials). Thus, the preservation/sulfide