

Consistent Matuyama-Brunhes magnetic transition records from depositional detrital and chemical remanent magnetizations from the Chiba Section, central Japan

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A detailed Matuyama-Brunhes (MB) magnetic polarity transition record has been reconstructed from the Chiba Section, central Japan. Oriented samples were collected every 10 cm from an 18-m thick marine sequence along the Yoro River. Rock magnetic and paleomagnetic experiments reveal that all of the sediments were deposited under anoxic environments, and natural remanent magnetizations are carried by magnetite and greigite throughout the sequence. Characteristic remanent magnetizations (ChRMs) isolated by thermal demagnetization (THD) and alternating field demagnetization (AFD) methods basically show consistent directions, except some differences. One of the major differences is the position of the MB boundary. It lies 115 ± 25 cm above the Byk-E tephra in the THD ChRMs, while 50 cm above the Byk-E tephra in the AFD ChRMs. We propose that the ChRM component isolated by THD is a depositional detrital remanent magnetization (DRM), and the component isolated by AFD is a depositional chemical remanent magnetization (CRM) carried by greigite. The latter is probably acquired in the subsurface pyrite formation process under anoxic environments. We found that the vertical paleomagnetic direction changes by the two methods are consistent when the AFD ChRM direction curve is shifted upward by 65 cm. This suggests that the lock-in depth of CRM is about 65 cm below that of DRM, and that the similar condition of remanence acquisition was kept for some time in the bottom of the basin.

Keywords: depositional chemical remanent magnetization, depositional detrital remanent magnetization, Matuyama-Brunhes magnetic reversal, greigite, magnetite