



Post-deformational growth of late diagenetic greigite in lacustrine sediments from Southern Italy

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Paleomagnetic, rock magnetic and micro-textural analyses from a Middle Pleistocene lacustrine sequence in the Southern Apennines (Italy) indicate the presence of greigite and magnetite as main magnetic minerals at different stratigraphic levels. In all cases a normal polarity characteristic remanent magnetization (ChRM) was observed, in agreement with an $40\text{Ar}-39\text{Ar}$ age of 0.712 ± 0.018 Ma. After correction for bedding tilt, the normal polarity directions, which are carried by greigite, do not coincide with the expected geocentric axial dipole field direction at the site latitude, whereas the magnetite ChRMs directions do. The data indicate that the greigite magnetization was acquired after tilting and after lock-in of the magnetite remanence. Scanning electron microscope analyses indicate that alteration of detrital volcanic minerals has occurred and that authigenic iron sulfides phase formed. Greigite is generally present in agglomerates and around volcanic grains. This observation is consistent with a late diagenetic origin of greigite due to the presence of anoxic conditions and availability of dissolved sulfide associated with decomposition of organic matter in the paleolake. Documentation of a late diagenetic magnetization suggests that care should be taken when using greigite-bearing sediments for magnetostratigraphic and tectonic studies.