Magnetite formation and its subsequent oxidation in Chinese loess/paleosol sequences

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Magnetic susceptibility variations of Chinese loess-paleosol sequences provide excellent records of paleoclimate change for the last 2.5 m.y. We collected loess, Holocene (S0) and last interglacial (S1) paleosol samples from northeast China. Low temperature magnetic behaviors indicate that non- or slightly oxidized magnetite is present in S0 soil and almost completely oxidized magnetite (maghemite) in S1 soil. Small grains (~0.07 micron) were found in the soil samples using transmission electron microscope and seems more corroded in S1 soil. Magnetic enhancement in soil layers results from a process that non-oxidized magnetite is primarily formed and subsequently oxidized.

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