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Burial, and consequences to magnetostratigraphy

C. Aubourg (1) and J-P. Pozzi (2)

(1) University of Cergy Pontoise, Geosciences & Environment, Neuville, France (aubourg@u-cergy.fr), (2) ENS Department of Geologie. Paris

Laboratory experiments from Ĩ00°C up to 250°C (3̃ to 5 km depth) point for the formation of pyrrhotite and magnetite in claystones. These experimental results are well supported by growing number of observation of pyrrhotite and magnetite in >2km-depth sedimentary rocks from various geological settings. We suggest therefore that the formation of pyrrhotite and magnetite is a common process during burial, and can lead to subsequent magnetic overprints. We propose a model of magnetic grains formation during burial with the continuous record of the magnetic earth field. Assuming that new magnetic grains overprinted the primary magnetization, our model shows that during burial, it is possible to have the record of reverse and normal polarity chrons, similar to those carried by a primary magnetization. Correlating these chrons to a standard magnetostratigraphy chart for dating rocks may be pointless if the magnetic overprint overwhelmed the primary magnetization. To prevent from a false interpretation of magnetostratigraphy, we will propose some tests, based on low-temperature (10K-300K) investigation of saturated isothermal remanent magnetization or high-temperature (20°C-600°C) demagnetization of natural remanent magnetization.