

FIRST APPROACH TO THE STUDY OF THE MAGNETIC REMANENCE CARRIERS IN PORTLAND CEMENT, CLINKER AND FURNACE SLAGS

1 BIDEGAIN, J.C.; 2 D'AGRELLA, M.; 3 RODRIGUEZ, M.E.; 2 SIQUEIRA, R.; 4 SINITO, A.M.¹ LEMIT-CIC, La Plata, Provincia de Buenos Aires, República Argentina² Instituto Astronómico e Geofísico, Universidade de Sao Paulo, Brazil³ CONICET, Universidad Nacional de Buenos Aires, República Argentina.⁴ CONICET, Universidad Nacional del Centro de la Provincia de Buenos Aires, República Argentina.

The magnetic constituents of Portland Cement acquire a magnetic remanence due to their alignment with the earth's magnetic field at the casting place. Portland cement based materials with different w/c ratios were analyzed by using conventional paleomagnetic techniques at the Buenos Aires Paleomagnetic Laboratory. The intensity of MR shows a near-linear relationship with the w/c ratios and the magnetic susceptibility varies according to water and furnace slags additions. The mode of magnetic remanence has been studied in previous research but the carrier of remanence is necessary to be differentiated for better understanding of Portland cement magnetic properties. In order to approach this target a translation Curie balance has also been employed. Thermomagnetic curves for Portland cement's clinker, slags and for Portland cement pastes with various w/c ratios were obtained. Three different Curie phases (around 250 °C, 580 °C, 760 °C respectively) were observed, having the following characteristic: 1) the 250 °C and 760 °C phases were stable upon heating (although with small changes in their Curie temperatures which can be correlated to oxidation); 2) when analyzing the furnace slags, the 580 °C (magnetite ?) phase is observed in small amounts being a by-product of the heating process, it appears only in the cooling curves and was originated from the clinker.