

CARACTERIZATION OF RED IRON PIGMENT AND SCALE TO SYNTHESIZE AN ANTICORROSIVE PAINT

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Abstract : The objective of this work is twofold: First, the use of natural raw materials and second is recycling Steel scrap which is a byproduct of steelmaking. The projection is to synthesis an anticorrosive paint. This is the first part of our study and it is devoted to characterization of these two components by chemical analysis, structures, hysteresis loop and grinding (fineness). Chemical analysis showed that the pigment contains 53.18% of total iron and gangue dominated by silica. Calamine in turn contains 73.83% iron as iron oxides. Microscopic observation in reflected light shows that the iron oxides in the pigment are in oolitic shape surrounded by the gangue. The scale has a largely uniform structure of magnetite. The magnetization tests have shown that the scale is ferrimagnetic and iron pigment is antiferromagnetic. The mill scale has a higher magnetic susceptibility because it contains magnetite. Iron pigment is composed mainly of hematite with little goethite, is classified as antiferromagnetic. Tests grinding have shown that the scale is much more suitable for grinding. Particle size analysis measured by a laser granulometer (Hydro 2000MU) gave us a volume distribution of the particles with a size between 0.7 and 32 microns for the scale and between 0.6 and 40 microns for the pigment. Thus the mean diameters are 3.75 microns and 4.01 microns for the scale and the pigment milled at 01 and 05 minutes respectively. Their specific surface areas are 1.6 and 1.5 m²/g. Characterization tests by diffractometer and observations with a scanning electron microscope are ongoing.

Keywords : iron Pigment, mill scale, iron oxides, grinding, and particle size.