VALORIZATION OF STEEL BYPRODUCTS IN THE FIELD OF ANTICORROSIVE PAINTS

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Abstract: The objective of this work is the valorization of an unavoidable by-product resulting from steel manufacturing at the El-Hadjar Iron and steel plant (Algeria). This by-product comes from oxidation of the outer layer of steel slabs and billets during cooling. This forms a crust called scale or calamine. In this study, the scale is used as a blend with iron pigments for the formulation of an anticorrosive paint. Several paint formulations at different scale (calamine) percentage have been prepared. The results of the various characterization tests i.e. dry extract, density, viscosity and corrosion test, show that the use of this new mixture as anti-corrosive paint gives encouraging results. In fact, immersion in a corrosive medium for 20 days at a concentration of 3.5% NaCl revealed a slight swelling on the painted sample surface. Optical microscope observation also displayed that the tested sample of 28.57% of calamine is the most resistant. This is furthermore confirmed by electrochemical analysis, where results are presenting low corrosion current and high potential close to the reference value.

Keywords: Scale, calamine, iron Pigment, Anticorrosive paints