

Valuation of mill scale as iron pigments for painting anticorrosive.

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Abstract: The mill scale is a steelmaking byproduct. This work focuses on the valuation of the steel waste and its transformation to a usable product in the field of anti-corrosion paints. These iron oxides have been examined as a pigment and corrosion inhibitor in two types of paints with different concentrations (1 %, 3 %, 7 %, and 15 %) to determine the best formulation. Their properties were compared to that of an anticorrosion paint trademark based on iron oxide. For this purpose various techniques of mechanical and physical-chemical analysis were used; grinding is applied to pieces of mill scale for very fine powders ($< 32 \mu\text{m}$); the particle size of the milled scale analysis, to determine their particle size distribution; a primary electrochemical method used to evaluate the performance and scale vis-à-vis the phenomenon of corrosion behavior, and a UV-Visible spectroscopic method for determining the concentration of total dissolved iron. The experimental results showed that the anti-corrosion properties or rather inhibition efficiency increases with increasing concentration of the mill scale in the tested paints.

Keywords : mill scale, corrosion inhibitor, spectroscopic, electrochemical analysis