Corrosion Performance of Nanopaint for Automotive Application

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Abstract Nanostructured coating that possessed high density of grain boundaries enable excellent physical coverage of the coated surface against corrosion and mechanical problems compared to the larger grain size of particles found in conventional paint. The current study focusses on the effect of SiO_2 and TiO_2 nanoparticles as additive in acrylic automotive paint for corrosion. The new paint namely nanopaints was prepared at three different concentrations. The nanopaint were characterized using Electro-chemical test and the open circuit potential (OCP) is recorded. Electrochemical test in a saltwater solution method also used to determine the potential of nanopaint concentration on automotive surfaces. The results reveal that nanoparticle additive provide better corrosion rate as compared to the original basecoat. The optimum anticorrosion behaviour for both TiO_2 and SiO_2 nanopaints were achieved at weight percentage of 1.5 wt% and 1.0 wt%, respectively. Therefore, the nanopaint has potential to provide better corrosion performance for automotive surface application.

Keywords Nanopaint · Corrosion · Automotive surface · Electro-chemical · Polarization

1 Introduction

Titanium oxide (TiO_2) is a common type of nanomaterial used in coating and corrosion applications. Industrial nanoscale TiO_2 was stored as a dry powder at room

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