

## Improving the anti-corrosion properties via surface modification for silicon dioxide by conductive polymer

### Abstract

The modification of silicon dioxide surface via polyaniline (PANI) prepared by in-situ polymerization method. PANI and PANI-SiO<sub>2</sub> were characterized using Fourier transform infrared; X-ray diffraction and digital multimeter was used to measure conductivities for samples. Morphology of the synthesized PANI and PANI-SiO<sub>2</sub>, were examined using scanning electron microscopy. Samples were then used as pigments through blended with acrylic paint and applied on the surface of carbon steel panels. Corrosion was evaluated for coating of carbon steel panels through; full immersion test, salt spray test and adhesion test up to standards; ASTM G 31, ASTM B117 and ASTM D3359 respectively. Corrosion rate and coating adhesion were calculated after finished exposed periods in acidic Medias. Digital camera also used for monitored corrosion visually on the surface of carbon steel specimens. The results revealed that acrylic paint pigmented by SiO<sub>2</sub> modified by polyaniline, more efficiently in corrosion protection for carbon steel than each of PANI and SiO<sub>2</sub>.