Non-Cracked Epoxy Nanogel Composite as Anticorrosive Coatings for Aggressive Marine Environment

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Cured epoxy coating crack is one of the drawbacks that can be solved by using self-healing preembedded nanomaterials to be an advanced prospective approach. In this work sodium montmorillonite modified with crosslinked nanogels based on smart sensitive N-isopropyl acrylamide (NIPAm) copolymers with nonionic monomer as N-vinyl pyrrolidone (VP) and ionic monomer of 2-acrylamido-2-methyl propane sulfonate sodium salt (AMPS-Na). The particle size, morphology, zeta potential, thermal stability and surface activity of Na-MMT nanogel in distilled and sea water were determined. The blending of Na-MMT nanogels with epoxy during the curing and their effects on exfoliation of Na-MMT and morphology were investigated. The corrosion inhibition efficiency of the cured epoxy embedded with Na-MMT nanogel as organic coats for steel was studied using salt spray resistance up to 1000 h.

Keywords: Embedded epoxy, Coatings, Salt spray, corrosion inhibition, steel.

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