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Topic: Development of nano conducting polymer dispersed sustainable resource

based polyurethane anticorrosive coatings

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Abstract

Corrosion, a natural phenomenon, has become a serious issue that people are facing with huge loss of health, materials and economy. Many efforts have been made to protect the metals from corrosion e.g. cleaning, passivation and the application of polymer coatings. However, the precursors for the synthesis of polymer coatings are mainly based on petroleum resources, which are limited and depleting every year. Moreover, the spiralling rise in their prices has led the researchers to look into alternative green and sustainable resources. Amongst various sustainable resources, vegetable oils are easily available, nontoxic, biodegradable, and largest sustainable resource. Various types of vegetable oil based polymers like alkyds, polyesters, epoxies, polyacrylates and polyurethanes have widely been synthesized. Compared to these oleo-polymers, oleo polyurethanes have attracted the researchers on account of their good ability for chemical modifications, thermal and excellent corrosion resistance However, under certain harsh condition their coatings fail to provide satisfactory performance. Thus, to overcome this drawback and to further enhance their performance various methods such as preparation of blend, IPNs, composites and nanocomposites have come into practice. Among these, formulation of oleo-polyurethane nanocomposite have attained a great deal of attention. Various nanofillers like carbon nanotube, metal oxides, graphene oxides, and conducting polymers have been dispersed to synthesize

polyurethane nanocomposites. Out of these, conducting polymer dispersed polyurethane nanocomposite have gained a tremendous consideration, due to their high conductivity, low cost, and high charge to surface area ratio. The combination of these two moieties provides the processability to the conducting polymers and enhances the physicomechanical, thermal and anticorrosive properties of polyurethane nanocomposite coatings. Because of these facts, the present thesis describes the synthesis and characterization of some novel conducting polymers, vegetable oil based polyurethanes and their nanocomposite coatings. The anticorrosive performance of these materials have discussed in detail in the thesis.