

CLAY BASED COMPOSITE POLYMER COATINGS: FABRICATION, CHARACTERIZATION AND APPLICATION

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Extending the life of any material and preventing the material from deterioration is of primary importance as this is associated with efficiency and economy of product. Protection from damage can be provided by coating the surface of the material. Coatings not only ensure protection but also offers decorative look to the material and endows it with advanced features. Coatings available today are quite expensive and each coating serves a specific purpose that is deemed to be a limitation in field of coating. To overcome this, the authors developed clay based polymer coatings which display exciting features at an economical way and are perfectly environmental friendly. The clay mineral used for the study is halloysite nanotubes (HNTs) which are naturally available and display unique and attractive features. HNTs possess a hollow tubular structure with 1000 nm, longitude length, outer diameter of 50 nm and 15 nm lumen spaces. HNT based polymer coatings are fabricated by ultrasound assisted processes which is a cleaner, greener and efficient method and can be applied to the substrate by simple dip coating method. These coatings were characterized by various techniques to determine its performance. They demonstrated extraordinary mechanical, thermal, hydrophobic, scratch resistance properties, additionally they enhanced solar material protection factor (SMPF) and solar skin protection factor (SSPF). These coatings can be applied to metals to protect them from corrosion, creep, fatigue, wear and tear.

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