

Synthesis and Properties of Photocured Surface Modified Polyaniline Hybrid Composites

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Abstract : Organic-inorganic hybrids have become an effective source of advanced materials because they combine the advantages of both the organic moiety such as flexibility, low dielectric constant, and processability, and inorganic moiety as rigidity, strength, durability, and thermal stability. By incorporating cross-linkable side chains, the hybrid materials can be made photosensitive and UV curable, which offers many advantages including low processing temperature, low equipment cost and compatibility. In this study, uv-curable organic-inorganic hybrid material, which was contained surface modified polyaniline particles (PANI), was prepared. PANI surface photografted with hydroxy ethyl methacrylate (HEMA) to produce hydroxyl groups. Hydroxyl functionalized PANI/HEMA was acrylated using isocyanato ethyl methacrylate (IEM) in order to improve the dispersion and interfacial interaction in composites. UV-curable formulation was prepared by mixing the surface modified PANI, polyethylene glycol diacrylate (PEGDA), trimethylolpropane triacrylate (TMPTA), hydrolized 3-methacryloxypropyltrimethoxysilane (hyd. MEMO) and photoinitiator. Chemical structure of nano-hybrid material was characterized by FTIR. FTIR spectra showed that the photografting of PANI was prepared successfully. Thermal properties of the nano-hybrid material were determined by thermogravimetric analysis (TGA). The morphology of the nano-hybrid material was performed by scanning electron microscopy (SEM).

Keywords : polyaniline, photograft, sol-gel, uv-curable polymer

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