

Synthesis and characterization of Polyimide/Silica nanocomposite thin films

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Organic and inorganic hybrid materials have been proved as a new type of material because it combines the respective advantages of organic and inorganic component. In this study, a series of polyimide/silica nanocomposites have been prepared from an aromatic polyamic acid derived from 4,4'-Diaminodiphenyl ether(ODA) and Pyromellitic Dianhydride (PMDA). PMDA, ODA was used as an Dianhydride and 4,4'-ODA was used as a Diamine and Tetraethyl orthosilicate was used to generate an inorganic polymer structure. The polyamic acid was imidized by heat using a certain ramp to form the cyclic polyimide. These films were successfully characterized for confirming the synthesis by the FT-IR. The TGA (Thermogravimetric analyzer) and DSC(Differential Scanning Calorimeter) was used to measure the Glass transition temperature and decomposition temperature. The Dielectric Analyzer was used to examine the dielectric constant of the Polyimide film. This study was conducted to examine the role of the silica to polyimide that was made into a film.