A Novel Negative Photoinitiator-free Photosensitive Polyimide with a Low Dielectric Constant

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This article describes the preparation of a kind of photoinitiator-free photosensitive polyimide (PSPI). A group of novel auto-photosensitive polyimides was prepared based on the flurorinated aromatic diamine 2,2'-bis(3-amino-4-hydroxyphenyl)hexafluoropropane diamine (AHHFP) and 3,3',5,5'-benzophenonetetracarboxylic dianhydride (BTDA). other polyimides were synthesized by copolymerization of 4,4'-(hexafluoroisopropylidene) diphthalic anhydride (6FDA) to more decrease dielectric constant and coefficient of thermal expansion. The polyimides were acrylated via a reaction with acryloyl chlroride in the presence of triethyl amine for the modification of aromatic polyimides. The chemical structure of the resulting polymer was confirmed by 1H NMR and Fourier transform infrared spectroscopy. The samples were characterized by UV analysis, thermogravimetric analysis (TGA) and thermomechanical analysis (TMA), dielectric constant, and so on. Photocuring was tested by lithography. The image was shown by the scanning electron micrograph (SEM).