

Facile Pore Morphology and Size Control of Spherical Polyimide Aerogel

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A new method for controlling pore size of the polyimide aerogel is demonstrated via using a simple process just before the curing process. Based on the polyimide aerogel synthesizing process invented in previous study, swelling method is utilized for enlarging the pore size via changing spherulitic formation mechanism. Newly developed method is simple and facile, which does not require any additional chemicals or cross-linkers to enlarge aerogel's pores which highly retains the homogeneity of the material. The demonstrated method has been tested by using various monomers to verify its possibility for application in diverse types of polyimide. Depending on the different backbone, those aerogels showed a similar slope but different changing range in increasing pore size. All synthesized aerogels were tested for retaining their original thermal, structural properties by Thermogravimetric analysis (TGA), Differential scanning calorimetry (DSC) and Fourier-transform infrared spectroscopy (FT-IR). Through this newly developed method, which is easy and showing its great effect in enlarging pore size, the limitation of controlling pore size in polymer gel could be solved easily.