Polyimide aerogel porosity control via swelling method

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The aerogel fabricated by using polyimide as a basic material has a uniform porous structure, and it remains the high thermal resistance and mechanical properties of the polyimide. Therefore, it can be widely used and applied in various industries. To increase the usage of polyimide aerogel, we have studied about the way of controlling the porosity and size of the aerogel. Herein, we utilized swelling method using acetone to enlarge the empty space between polyimide chain in solution considering that the space created will cause porosity to increase. Finally, we got the aerogel with high porosity. In addition, the controlling temperature and pressure was the main factors which can influence the size of aerogel. We successfully found out the way to control the size and porosity of aerogel, and this founding will give potential for the polymer aerogel materials to use as catalysts and filteration for various size of particles.