

Research on polymer crosslinking modification of silicon-based aerogels

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Abstract: The poor mechanical properties of traditional SiO₂ aerogel materials can be solved by cross-linking the silica structure of aerogel with the polymer. Polymer-crosslinked aerogels have a conformal polymer coating that covalently connects aerogel skeleton nanoparticles. Its body density is very low, but the specific compression strength of the material is higher than that of mild steel and aluminum. The introduction of polymers into aerogels is primarily the borrowing, modification and adoption of concepts developed for dry gels. Therefore, in order to identify the problems and possibilities in polymer doped aerogels, it is necessary to discuss these materials from the broader perspective of polymer/sol-gel composites.

Keyword: aerogel; polymer; cross-linking; compression strength; mechanical properties.

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