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Flexible, elastic, and superhydrophobic silica-polymer composite aerogels by high internal phase emulsion process

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ABSTRACT

Flexible, elastic, low density, superhydrophobic, and low thermal conductive silica-polymer composite aerogel materials were prepared by a high internal phase emulsion (HIPE) process followed with sol-gel process. Flexible silica aerogels were grown in the scaffold of macro-porous flexible polymer monolith to overcome the brittle nature of silica aerogels. Initially, porous polymer monolith was prepared by HIPE and was used as a scaffold for preparation of flexible silica aerogels by sol-gel process followed by supercritical drying. Polymer monolith was soaked in a pre-hydrolyzed methyltrimethoxysilane (MTMS) based silica

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