

Research on silicon-based non-oxide high temperature ceramic aerogels

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Abstracts: The excellent adsorption properties of SiO₂ aerogels stem from its interpenetrating pore structure and tailorable chemical composition and surface chemical structure. Gas or liquid can be selectively diffused and circulated to the whole material through the interconnected pores. This characteristic makes SiO₂ aerogel has become an ideal new adsorbent and has good application prospects in the fields of water treatment, gas separation and drug loading. However, due to its structural characteristics, SiO₂ aerogel has poor structural stability at high temperatures. In recent years, researchers have conducted a series of research and development on silicon-based non-oxide ceramic aerogels. In view of the excellent temperature resistance and mechanical properties of SiC and Si₃N₄, they can be combined with the structural characteristics of SiO₂. Developed a silicon-based non-oxide ceramic high temperature resistant aerogel, which in turn enables the aerogel to maintain its structural stability at temperatures above 1600°C.

Keyword: aerogel; SiC; Si₃N₄; High temperature resistance; ceramics.

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