Research progress on preparation and application of aerogel film materials

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Abstract

Aerogel materials have an open or semi-open nanoscale pore structure and a continuous three-dimensional network structure [1]. Due to its excellent properties such as low thermal conductivity, low dielectric constant, high porosity, high specific surface area, adjustable refractive index, etc., it has been widely used. With the rapid development of micro-miniature electronic devices, especially flexible wearable electronic devices, thin-film aerogels have become the focus of research[2].

Compared with aerogel bulk or powder materials, aerogel films mainly exist in the form of unsupported films and coatings. Aerogel films mainly exist in the form of unsupported films and coatings[3], which not only retain most of the excellent properties of bulk aerogels, but are also used in emerging fields due to their unique film types, such as new energy batteries, personal Wearable devices, construction biomedical carriers, pollutant treatment, etc[4]. This article outlines the aerogel film's sol preparation process and coating forming process, combined with relevant domestic and foreign research reports, highlights the aerogel film in thermal, electrical, mechanical properties and in microelectronic devices, architectural glass, solar cells, etc. Application in the field, and prospects for the development of aerogel film materials.

Keywords

aerogel films; sol-gel Films; preparations; application

Reference

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