



Application of Aerogel in Building Energy-saving

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Abstract

Each year, China consumes more than 1.4×10^8 t coal for supplying heat. However, an urgent problem is that a large percent of the heat is not fully used but lost to external through the windows, walls and roofs. The paper mainly talks about how to improve the thermal insulation property of the buildings by adopting aerogel in order to reduce the unnecessary consumption of coal. Aerogel is a solid-state material with a density lower than that of the air and extraordinary performances in heat insulation and fire resistance which can be seen in the fact that the temperature it can withstand is more than ten times than other common materials. This paper aims at studying the application of particle aerogels, plate aerogels, and glass aerogels in the construction industry. And some application methods of aerogel are put forward connected with CRTS slab, architectural glass and non-bearing structure.

Keywords: Aerogels; building energy saving; thermal insulation materials

1 Introduction

In recent years, with the gradual transformation of Chinese economy, environment protection is getting more attention to by the government, investors and academicians. "KEEP THE GREEN " is not just a slogan. By the end of 2016, China national new material leading group was established. Not only at the national level, but also in the industry, we think more highly of new material especially the aerogel industry. On April 7th 2017, "2017 national aerogel application seminar" was held in Beijing ^[1]. With this

advancement of national policy and growing attention of industry, how to develop the aerogel industry gradually becoming the hot spot of attention.

Aerogel is a kind of material with extremely strong property sound insulation performance and high light transmission. Its porosity is high 80% to 99.8%; minimum density is low at 0.003 g/cm^3 ^[2]. In 1930, SiO_2 aerogel was prepared by supercritical drying, but at that time, aerogel was not put into the market. After years of experimental demonstration and research of many scholars, many excellent properties of