MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialized Technologies, including Nanotechnology (8)

Author: Mr. Yao Xian-zhou
China, yaoxianzhou@126.com

Dr. Zijun Hu
China, huzijun@hotmail.com

A THEORETICAL CALCULATION OF THERMAL CONDUCTIVITY OF SILLICA AEOGEL

Abstract

Abstract One regular model which is a cubic array of intersecting square rods similar to actual microstructure of sillica aerogel is presented to evaluate the effects of nanostructure of the SiO2 aerogel on the thermal properties. Steady gas-solid coupling thermal conduction of one dimension in micro-model cell is analyzed. The calculated value of the effective thermal conductivity is 0.011 W/ m•K close to the experimental value which is 0.012W/(m•K). At the same time, the result shows that pore diameter distribution of material, especially macropore and micropore, has an important influence on its thermal conductivity.

Key words SiO2 aerogel effective thermal conductivity theoretical model