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Thermal diffusivity of solids with a low expansion coefficient: A dilatometric technique

Journal International Journal of Thermophysics
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 Pages 711-718
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**Solid-State Physics**

Patterson, James D., Bailey, Bernard C.

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Abstract A dilatometric method is presented, suitable to obtain both thermal diffusivity and conductivity of low-conducting solids with a low expansion coefficient. The repeatability of the measurements of thermal conductivity is 3%, whereas that for diffusivity is 5%. Data for fused silica at room temperature are given, consistent with those reported in the literature. Since the method is based on detecting the thermal expansion of a copper disk in thermal contact with the specimen, its range of applicability is linked to the sensitivity by which the dilation of copper can be measured: no difficulty arises between liquid nitrogen and 1000°C.

Key words low-conducting materials - low-expanding materials - thermal conductivity - thermal diffusivity

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1. Dincer, Ibrahim (1995) An exact modelling for thermal diffusivities of solid objects exposed to heating. *International Journal of Energy Research* 19(8) [CrossRef]
2. Omini, M. (1994) A dilatometric method to measure the thermal diffusivity of nonmetallic liquids. *International Journal of Thermophysics* 15(2) [CrossRef]



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