



Determination of the thermal conductivity by using the Hot Wire Method

By Giovanni Alcocer

LAP Lambert Academic Publishing Jul 2014, 2014. Taschenbuch. Condition: Neu. Neuware - The measurement of the physical properties (density, viscosity, surface tension, thermal conductivity, etc.) is of great importance to the research, industry and physical, chemical and biomedical applications. The thermal conductivity is a measurement of the material's ability to conduct heat. The Transient Hot Wire method is a suitable method to measure the thermal conductivity due to its very cheap cost of construction, accuracy and because it is a fast method of measurement. The implementation requires accurate temperature sensing, automatic control, data acquisition and data analysis. The basic procedure consists of measuring the temporal temperature rise in a thermoresistance (thin wire) immersed in the solution by applying an electrical current in the wire. Therefore, the wire works as a heat source and a temperature sensor. The time of measurement is very short and therefore the convection effect could be minimized. Then, the heat transfer to the infinite medium is due only to the conduction transfer effect. The thermal conductivity can be determined from the slope of the curve T versus $\ln(t)$ due to the linear relation between T and $\ln(t)$. 60 pp. Englisch.



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