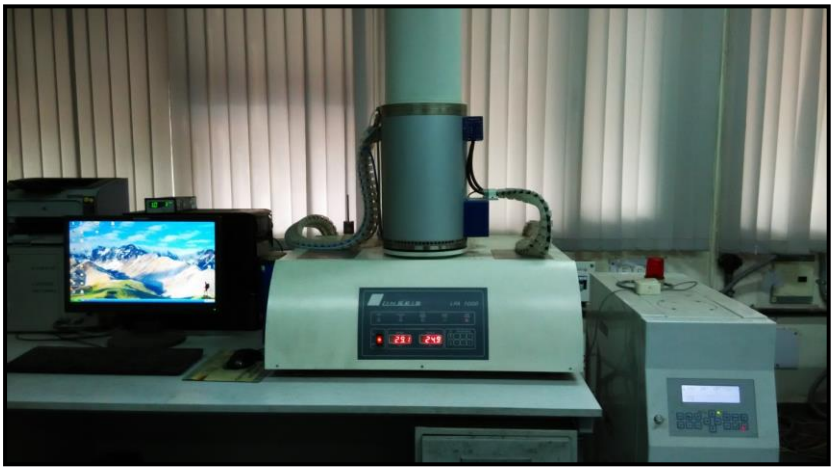
Measurement of: Thermal diffusivity

Equipment: Laser Flash Apparatus Model (LFA 1000), Linseis Messgeraete GmbH, Germany

Property Measured: Thermal diffusivity

Photograph (small size)



Basic Principle:

The laser flash technique is currently the most widely accepted method for precise measurement of the thermal diffusivity, high precision and reproducibility; short measurement times, variable Sample holders and defined atmosphere are outstanding features of LFA measurement over the Entire application range from RT to 1000°C. The sample is positioned on a sample robot, located in furnace. The furnace then held at a predetermined temperature. At this temperature the sample bottom is then irradiated with a programmed energy pulse (Nd: YAG Laser). This energy pulse results in a homogeneous temperature rise at the sample top. The resulting temperature rise on the top surface of the sample is measured by a high speed IR detector and thermal diffusivity values are computed from the temperature rise verses time data. The resulting measuring signal computes the thermal diffusivity data.

Capabilities: Thermal diffusivity measurement from room temperature to 900°C. If the density (ρ) & the specific heat (Cp) are identified, the thermal conductivity can be calculated by using the relation: Thermal conductivity (κ) = Diffusivity × specific heat × density.

Sample Requirement: This instrument measures the themal diffusivity of solids of size 12.7 mm disc of thickness 1-3 mm