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The Measurement of Thermal Diffusivity in Conductor and Insulator by Photodeflection Technique

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The purpose of this study is to compare and estimate thermal diffusivities of conductor and insulator material by using photothermal deflection which varies frequency. The experimental setup consists of 2 laser lines: 1) a pump laser beams through a modulator, varied frequency, controlled by lock-in amplifier then focused beam at sample surface by lens. 2) a probe laser which is perpendicular with the pump laser beam skims the sample surface. The probe laser deflection signal is obtained by a position sensor controlled by lock-in amplifier. Thermal diffusivity is calculated by measuring the amplitude and phase of the Photodeflection signal and compared with the thermal diffusivity of standard value. The results of thermal diffusivities, calculated by amplitude and phase, are slightly different from the standard value.

Author: ACHATHONGSUK, Uthed

Co-authors: Mr RITTIDACH, Tanawat; Mr TIPMONTA, Pongsakorn; Mr KIJAMNAJSUK, Puchong; CHOTIKAPRAKHAN, Sutharat (Kasetsart University)

Presenter: ACHATHONGSUK, Uthed

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