

Measuring thermal parameter by thermal diffusion length measurement using OF-TWRC technique

ABSTRACT

The newly developed Optical Fiber TWRC technique or shortly as OF-TWRC was used to determine the thermal diffusivity of liquids from the thermal diffusion length obtained from the curve of pyroelectric amplitude exponential decay with respect to cavity length and compared with the linear fitting of pyroelectric phase signal. The average thermal diffusivity of water obtained by this calculated method gives the value for water as $1.472 \times 10^{-3} \text{ cm}^2/\text{s}$. The thermal parameters for water and for other liquids agree with reported values in the literature.

Keyword: Thermal parameter; Thermal diffusion length; OF-TWRC technique