Photoacoustic Thermal and Optical Characterization of Pigments in Liquid Solution

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A new Photoacoustic (PA) technique for the measurement of the thermal diffusivity and the optical absorption coefficient for pigments in liquid solution is described. The corresponding methodology involves the sample´s PA signal in the thermally thick regime, as a function of the liquid sample´s thickness, and makes use of the PA transmission configuration. Criteria as to decide whether the theoretical assumptions applied are valid are also provided. The thermal diffusivity and the optical absorption coefficient (at 658 nm) for solutions of methylene blue in distilled water, at various concentrations, are used to test this methodology. The optical properties obtained by means of this PA methodology are compared with similar optical properties as measured by means of commercial spectrophotometers, excellent agreement is obtained.

The author thanks the support of COFAA-IPN and CONACyT.

[1] J. A. Balderas-López, Review of Scientific Insruments, 77, 086104, 2006.