Self-Normalized Photoacoustic Technique for Thermal and Optical Characterization of Pigments in Solid Substrates

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A self-normalized photoacoustic (PA) methodology for thermal and optical characterization of pigments in a solid substrate is presented. The self-normalization procedure involves the ratio of PA complex signals for the front and rear PA configurations, as a function of the modulation frequency, in the sample´s thermally thick regime, assuming the Beer-lambert model for light absorption. Some criteria as to validate the data selection in this thermally thick regime are also provided. The optical absorption coefficient (at 658 nm) of filter papers (Whatman No. 1) with methylene blue, at various concentrations, were measured with this new PA methodology. The results were in good agreement with the corresponding ones made made with a commercial spectrophotometer.

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