Photopyroelectric Thermal Effusivity Measurements of Transparent Liquid Mixtures

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The thermal effusivity of some transparent liquid mixtures is measured by means of a photopyroelectric technique in the standard front-surface configuration.

The photothermal methodology involves light transmission across the transparent sample and its consequent absorption on the surface of the pyroelectric sensor that is assumed to be in the thermally thick regime. A signal normalization procedure, which avoids the conventional requirement for transfer function determination, is implemented. The thermal effusivity of mixtures of acetone and ethanol in distilled water is measured, at room temperature, in a wide range of concentrations. Some empirical models are used to establish the functional relation between this thermal property and the concentration of ethanol and acetone.