Public Abstract

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Graduation Term:SS 2007

Department:Biological Engineering

Degree:MS

Title:RATIOMETRIC TECHNIQUES TO DETERMINE FLUID VISCOSITY USING MOLECULAR ROTORS

Molecular rotors exhibit viscosity-dependent quantum yield, potentially allowing measurements of fluid viscosity in non-mechanical manner. Several diseases are accompanied by blood plasma viscosity changes; therefore, a diagnostic tool is desirable to measure blood plasma and other biofluids viscosities. When measuring fluorescence emission intensity, the optical properties of the biofluids (absorption and scattering) and the dye concentration influence the measured intensity. We designed a ratiometric fluorophotometer capable of determining fluorescence emission intensity concurrently with biofluid absorption at the dye's excitation and scattering. Validation of the prototype showed excellent correlation of measured values with commercial fluorophotometer and spectrometer. The information gathered by the instrument can eliminate the influence of turbidity and yield corrected fluorescence emission intensity. On account of correcting the emission measurement for fluid optical properties, a main drawback of commercial fluorophotometers can be overcome. The instrument is characterized by inexpensive design, emission based on light emitted diodes, its speed, and its increased measurement precision.