

Study of interaction between quinine sulphate and riboflavin in aqueous micellar solution and analytical application on determination of riboflavin

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Fluorescence resonance energy transfer (FRET) between quinine sulphate and riboflavin (vitamin B2) is studied by fluorescence and UV-VIS absorption spectroscopy in aqueous micellar solution. The fluorescence of quinine sulphate is quenched by riboflavin and quenching is in accordance with Stern-Volmer (S-V) relation. The efficiency of energy transfer is found to depend on the concentration of riboflavin. The thermodynamic parameters estimated from the fluorescence quenching studies at three different temperatures indicated that the drug-biomolecule interaction in the present system involves electrostatic interaction to form non emissive complex. The value of critical energy transfer (R_0) = 42.11 Å calculated by using Förster relation (less than 50 Å) indicates efficient energy transfer between two components. The analytical relation was established between extent of fluorescence quenching and concentration of riboflavin to determine vitamin B2 directly from pharmaceutical samples.

Keywords: Fluorescence Resonance Energy Transfer (FRET), Quinine sulphate, Riboflavin, Cetyl trimethylammonium bromide (CTAB), thermodynamic parameters

Biography

S. R. Patil has made significant contribution in Bio-analytical Chemistry and Material Science by publishing 38 articles in the research journals of national and international repute. In addition, he has also contributed in teaching, curriculum and extra curricular activities of the home university and other universities of Maharashtra State. Dr. Patil was visiting Professor to Department of Chemistry, Hanyang University, South Korea. The analytical methods developed for determination of Drugs, Biomolecules like Vitamins, components of DNA etc and molecular interaction studies between Drug and Bio-molecules are based on Fluorescence Resonance Energy Transfer (FRET) phenomenon. Currently, the work on preparation of Organic Nanoparticles (NPs) for development of Bio-analytical technique is in progress.

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