A fluorescent probe for alkanes, surfactants, lipids and self-organized molecular aggregates

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Abstract

Low-toxic coralyne, a cationic benzo[c]phenanthridine type alkaloid (Fig. 1), has received extensive attention because of its DNA- and RNA-targeting properties, and antimicrobial, anticancer activity, more pronounced compared to other protoberberine alkaloids [1-3]. In a previous work we showed that the fluorescence intensity alteration of coralyne-impregnated silica gel plates allows the sensitive quantitative detection of a wide number of analytes by high-performance thin layer chromatographic techniques [4].
It has been shown that coralyne cation undergoes self-aggregation in aqueous solutions by stacking interactions, even at low dye concentration, being the dimer less fluorescent than the monomer [5, 6]. In this work we have studied the influence of temperature in dimer formation.
Due to its large flat aromatic structure, coralyne also has a high tendency to penetration into organized assemblies in solution with hydrophobic core such as micelles or liposomes, and we present here a fluorescence study of coralyne in different microheterogeneous media. Fluorescence emission increases when coralyne probe is situated in apolar microenvironments which prevent non-radiative desexcitation pahtways (Fig. 2).

References

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Figures

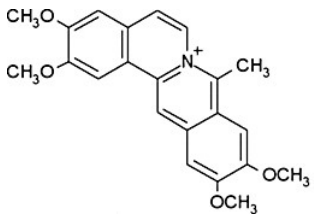

Fig. 1. Chemical structure of coralyne.

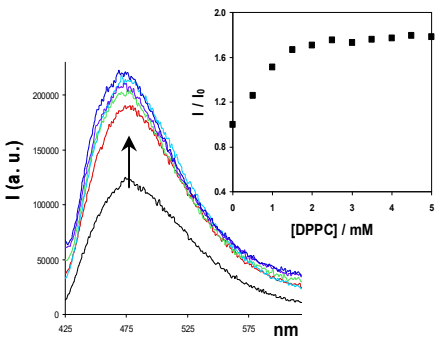

Fig. 2. Fluorescence of coralyne in DPPC liposomes buffer solution (pH 7.4).