



Effect of Hofmeister series salts and BSA on fluorescein compounds

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Abstract: The biophysical parameters like pH of the medium, temperature, refractive index, extinction coefficient of fluorescent compound etc. are responsible for fluorescence quantum yield. Even after maintaining these parameters constant in an assay, peculiarities do occur with respect to quantum yield due to presence of salts and proteins present in the medium. Most of the fluorescent compounds have different quantum yields in presence of Hofmeister series salts and their behaviour has never been studied thoroughly. We performed a systematic study of effects of Hofmeister series salts (urea, sodium chloride, ammonium sulphate, and guanidine isothiocyanate) and BSA (0.1 mg/mL) on fluorescence quantum yield for seven different fluorescent compounds (fluorescein, fluorescein isothiocyanate, DSSA, FITC-attached staurosporine, FITC-attached estrogen, FITC-attached NADH and FITC-attached NADPH). Presence of guanidine isothiocyanate and $(\text{NH}_4)_2\text{SO}_4$ has drastically reduced fluorescence quantum yield of all compounds. In general, presence of salts like urea has increased quantum yield, BSA and other salts have minimum effect on quantum yield. Among the dyes studied, the two groups obtained are fluorescein, FITC and E2-FITC in the first; FITC-staurosporine, FITC-NADH and FITC-NADPH in the second, which have similar fluorescence quantum yield behaviour in the studied buffers. DSSA seems to be unique from all the studied buffers due to the presence of two dyes in its structure.

Keywords: Hofmeister series, Fluorescent probes, Kosmotropes, Chaotropes, Fluorescence quantum yield.