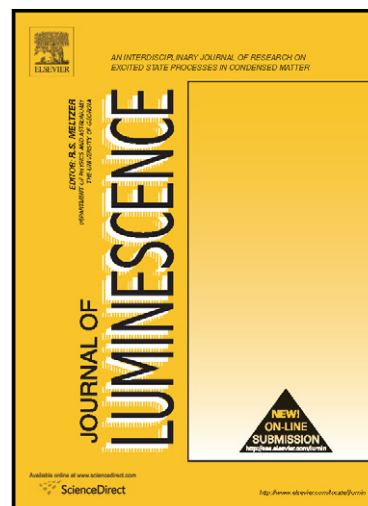


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Turn-on fluorescence probes based on pyranine/viologen charge-transfer complexes for the determination of nucleotides

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Turn-on fluorescence probes based on pyranine/viologen charge- transfer complexes for the determination of nucleotides

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The formation of ground state charge-transfer complexes between pyranine (8-hydroxypyrene-1,3,6-trisulfonic acid) and viologen (paraquat) derivatives is utilized for the design of novel fluoroionophores for the determination of phosphate species, particularly of nucleotides. The strong quenching of the pyranine fluorescence by viologen-type charge transfer acceptors can be countermanded if these are functionalized with triethylammonium groups that serve as recognition elements for phosphate anions. We report on the fluorogenic responses of these water-soluble molecular probes in presence of different phosphates. Absorbance measurements give additional information on the charge transfer complex formation and the interaction with nucleotides. The experimental data show that these aggregates form attractive, simple and versatile fluorescence turn-on probes for nucleoside triphosphates. The reversibility of the fluorescence response is demonstrated by means of an enzymatic model assay using ATPase for the decomposition of adenosine triphosphate.

Keywords: ATP, phosphate, charge transfer complex, fluorescence, pyranine, viologen

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