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Preface: Special Issue on Solvatochromic Fluorophores

The utility of fluorescence as an experimental technique almost always relies on the ability of a responding fluorophore to distinguish differences in some property in its immediate environment. Fluorophores showing special sensitivities to solvent polarity or their solvation generally are deemed *solvatochromic*. Solvatochromic fluorophores are exploited in many common applications: well-known examples include tryptophan and PRODAN. Beyond application to particular problems, however, the study of solvatochromic fluorescence itself offers many interesting challenges for both the experimentalist and the theoretician. The design of new or improved fluorophores demonstrating solvent sensitivity represents one such area; understanding the physical and chemical factors underlying solvent sensitivity represents another. All of these aspects of solvatochromic fluorescence are, of course, mutually dependent. The development of useful applications requires the availability of appropriate fluorophores, and correct interpretation of the response of these fluorophores requires a good understanding of how they interact with solvents and their environment.

In this special issue of the *Journal of Fluorescence*, five articles concerned with solvatochromic fluorophores and their properties are presented. These articles touch on all of the aspects of solvatochromic fluorescence mentioned above. In the first, 4-aminophthalimide and its derivatives are discussed as probes for the study of structures such as cyclodextrins and micelles. The basis of their solvatochromic response is also examined. The second and third articles deal with the solvatochromic response of the popular probe PRODAN and some structurally related fluorophores in pure solvents and membranes. The emphasis here is on understanding interactions between these fluorophores and their environments in solution. The fourth article characterizes some recently prepared pyrazoloquinoline compounds. These compounds possess a structural feature shared by many solvatochromic fluorophores: the presence of electron donating and accepting substituents. Such substituents lead to differences in charge distribution and dipole moment between the ground and the excited electronic states, with associated sensitivity to solvent polarity. The final article explores the solvatochromic and thermochromic response of Nile Red. The experimental response is compared to its description by two general models of solvatochromic fluorescence, and semiempirical modeling is employed in an attempt to understand better the nature of the emitting electronic state.

The international authorship of these five articles attests to the widespread and continuing interest in the use, development, and characterization of solvatochromic fluorophores. On behalf of the Journal, it has been my pleasure to serve as organizer for this special issue.

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