

PR-138

AGGREGATION OF 1,5-DI(PYRENYL-1)PENTANE IN AQUEOUS ORGANIC MEDIA

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Abstract. Alkanes disubstituted at the terminals of various PAHs (including pyrene) are well known and their photophysical properties have been described in detail earlier.¹ They are especially known for forming intramolecular excimers. There have been no studies of the nature of the excimer formation in aqueous media and described for now experiments were done in organic solvents only.

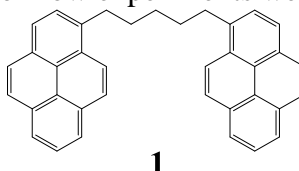


Figure 1. Structure of 1,5-di(pyrenyl-1)pentane **1**

We have previously described the photophysical properties of **1** in aqueous DMSO.² For examining the nature of the unstructured red-shifted emission ($\lambda_{Em}=478$ nm), excitation spectra were recorded at monomer and excimer emission wavelengths, DLS and cryo-SEM studies were carried out, and the I_{Ex}/I_M ratio was calculated. Based on the presence of aggregates in the environment of aqueous DMSO (confirmed by DLS experiments and cryo-SEM imaging), the presence of plateau zones in the I_{Ex}/I_M ratio vs concentration graph (Fig. 2B), as well as a decrease in peak-to-valley ratio, the presence of bathochromic shift and overall broadening of excitation spectra (Fig. 2C), it can be assumed that the unstructured emission ($\lambda_{Em}=478$ nm) is not attributed to the dynamic formation of intramolecular excimers only, but also is due to the excitation of preassociated static dimers.

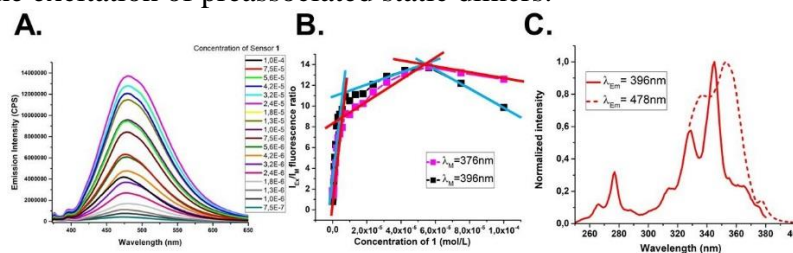


Figure 2. Overlay graph of fluorescent intensity of **1** at different concentration (A), I_{Ex}/I_M ratio vs concentration graph (B), excitation spectra of **1** monitored at different wavelengths (C).

References

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