

PROBING SUPRAMOLECULAR ASSEMBLIES
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ABSTRACT

Supramolecular, self-assembled nanocapsules have shown the capability to encapsulate organic guests. Since most of the work was done previously in the solid state, the novelty of this research was its focus on probing hydrogen-bonded C-alkylpyrogallol[4]arenes, PgC₆, nanocapsules in the solution. Nanocontainers of PgC₆ were self-assembled from six Pg building blocks, enclosing over 1200 Å³ of space. Steady-state and dynamic fluorescence spectroscopic techniques were used to interrogate the organization of the capsule interior when fluorescent reporter molecules, (1-(9-anthryl)-3-(4-dimethylaniline) propane) and pyrene butyric acid, became entrapped. Solution state spectroscopic data, in agreement with solid state single crystal X-ray crystallographic results, determined the number of guests encapsulated, the nature of the

entrapment, and the robustness of the host-guest interaction. Additional work alluded to the goodness-of-fit criterion between guest and host for successful encapsulation of future entities. This work advanced the understanding of the unique nanopockets created by these PgC_6 assemblies.