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## **Spectroscopic investigations of dendritic polymers with phenol blue**

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Previous spectroscopic investigations, utilizing the fluorescent reporter molecule phenol blue, showed that the probe resided in the core region of dendritic polymers. Two dendrimer families were investigated – propyleneimine (PPI) and polyamido amine (PAMAM). This dye molecule provided information about the interior microenvironment of the dendrimers, which are potentially useful in applications ranging from sensors to catalysis to microreactors to drug carriers. Given their beneficial uses, the dendrimers ability to act as container molecules was further characterized in this study. Water was used as the original solvent because phenol blue is only slightly soluble in it, and the dye is attracted to the hydrophobic interior of the dendrimer. Phenol blue was added to aqueous solutions of PPI and PAMAM dendrimers of varying sizes and analyzed. Absorption, anisotropy, and fluorescence emission measurements were taken to show that phenol blue dye did associate with the dendrimer in the core region as expected. Samples were then heated to remove the water, and the solvent was replaced by adding methanol to the samples. Methanol was chosen because both phenol blue and the dendrimers are very soluble in it. This solvent should provide an opportunity for the dye to diffuse back into the bulk solution. The experimental measurements were repeated and revealed that phenol blue remains inside the dendrimers, once it is associated. This makes their utility as transporter molecules, etc. very desirable, as the payload can be retained.