

**NANOCABLE PRECURSOR BASED ON
POLY(PHTHALOCYANINE-CO-ETHYLENE OXIDE)**

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ABSTRACT

A nanocable precursors, based on a Copper Phthalocyanine (CuPc) tetramer and ethylene glycol oligomer, were obtained and characterized. It was used three different PEG molecular weight, 350, 550 and 750. The resulting three water soluble copolymers were characterized by FTIR, -OMe end group titration analysis and TGA.

EXPERIMENTAL

a) Synthesis of Phthalocyanine Polymer. The phthalocyanine polymers was studied because its relatively high room-temperature electrical conductivity¹⁻⁶, ranging from 10^{-6} - 10^{-1} S cm⁻¹. The synthesis of *Poly(Phthalocyanine)* was done by the cyclotetramerization of pyromellitic dianhydride and urea with copper chloride to form a highly conjugated 2-dimensional network^{1a}. This network is often referred as *Poly(Phthalocyanine)*.

Experimental

a) Synthesis of poli(phthalocianine-co-ethylene oxide). The 2-D polyphthalocyanine, obtained as reported elsewhere¹ (right side of the chemical reaction; phthalocyanine polymers was studied because its relatively high room-temperature electrical conductivity¹⁻⁶, ranging from 10^{-6} - 10^{-1} S cm⁻¹.), was reacted by esterification with end-capped PEG of different molecular weights (350, 550 and 750), catalyzed by sulphuric acid to form the nonionic discotic surfactant described in Figure 1.

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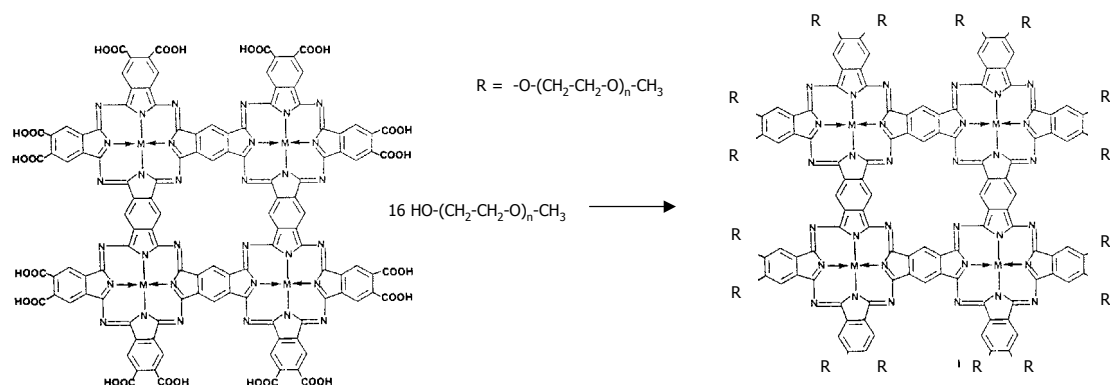


Figure 1. Reaction for the synthesis of poly(phthalocyanine-co-ethylene oxide) [discotic polymer]

c) Purification of the products. The copolymers were purified by silica column chromatography using a mixture of 1:1 dichloromethane-ethanol.

c) Characterization of the products. All products were characterized by thermogravimetric and chemical analysis (end group titration). The lyotropic assembling properties in polar and non-polar solvents were followed by UV experiments.

CONCLUSIONS

Thermogravimetric analysis and end group titration reveals that structure of the phthalocyanine discotic polymer agrees with the one shown in Figure 2. Also the stacking behavior of this discotic polymers were confirm by UV absorption spectrum. Some attempt to construct nanocables with this polymers shows a fairly ordered mesophase.

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