

CHIRAL RECOGNITION BY POLYMETHACRYLIC ZINC PORPHYRINS

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ABSTRACT

In recent years there has been a widespread interest in the study of new methodologies to determine the absolute configuration of chiral compounds. In particular a new system based on a reversible host/guest complexation mechanism using a low molecular weight porphyrin derivative (zinc-porphyrin tweezer) as a host and a bidentate chiral substrate as a guest has been developed [1-3]. In this context new methacrylic polymers, bearing in the side chain zinc tetraarylporphyrin moieties, have been prepared by radical polymerization and fully characterized. These polymeric zinc-porphyrin derivatives resulted capable to bind optically active α,ω -diamines through amine nitrogen/zinc coordination to form complexes exhibiting exciton-coupled bisignate Circular Dichroism (CD) spectra. This behavior is typical of exciton splitting determined by cooperative interactions between side-chain porphyrin chromophores disposed in a mutual chiral geometry of one prevailing handedness. Being the observed couplet sign a direct consequence of the chirality of the diamine, which is transmitted to a prevailing helical handedness of the interacting chromophores, the assignment of chirality is nonempirical.

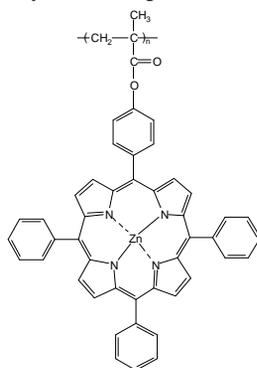


Fig. 1: Structure of the methacrylic homopolymer poly[Zn-M-TPP].

We also report on these materials ability to bind optically active guests of different length. Furthermore we have studied the effects induced on the thermal, UV-vis and chiroptical properties and on the ability in chiral recognition of these photochromic materials by progressively spacing out the porphyrinic optically active repeating units along the polymeric backbone through the insertion of an achiral *co*-monomer.

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References:

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