

Synthesis of Star Compounds Bearing a Porphyrin Core and Cholic Acid Units by Using Click Chemistry: Study of the Optical Properties and Aggregation

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Abstract : Four new star compounds bearing a porphyrin core and cholic acid units, (TPPh(Zn) tetra-CA, TPPH(2H) tetra-CA, TPPH(Zn) octa-CA and TPPH(2H) octa-CA), have been synthesized using the Click Chemistry approach, which consist on azide-alkyne couplings. These novel functionalized porphyrins were characterized by ¹H and ¹³C NMR spectroscopy and their structure was confirmed by MALDI-TOF. The optical properties of these compounds were studied by absorption and fluorescence spectroscopy. On the other hand, order to evaluate the amphiphilic properties of the cholic acid units combined with the optical response of the porphyrin core, we performed absorption and fluorescence studies in function of the polarity of the environment. It was found that as soon as we increase the polarity of the solvent, the Zn-metallated porphyrins, (TPPh(Zn) tetra-CA and TPPH(Zn) octa-CA), are able to form J aggregates, whereas the free-base porphyrins, TPPH(2H) tetra-CA and TPPH(2H) octa-CA, behaved differently.

Keywords : aggregates, amphiphilic, cholic acid, click-chemistry, porphyrin

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