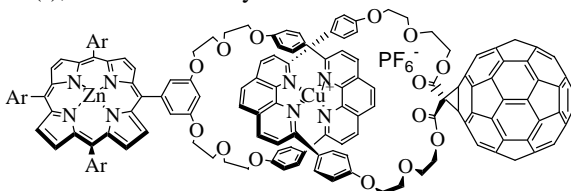


Synthesis and Photophysics of Rotaxanes and Catenanes Incorporating Fullerenes and Porphyrins

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Adapting the synthetic techniques pioneered by Sauvage and his coworkers at Strasbourg, using Cu^I-phenanthroline complexes as templates, we have succeeded in synthesizing a variety of rotaxanes and catenanes incorporating both fullerenes and porphyrins. Such systems, in which the porphyrin and the fullerene are mechanically and not covalently linked, are of particular interest in terms of the possibilities for electronic communication between the two moieties following photoexcitation of the porphyrin, in the Cu(I) complexes as well as in Cu-free systems. The rate constants for intramolecular electron and energy transfer, and of back electron transfer, will be compared with those for analogous systems studied in our laboratory and elsewhere, in which the fullerene and C₆₀ moieties are directly linked. These data will be discussed in the context of the topological differences in the new rotaxanes and catenanes, with and without Cu(I), as determined by molecular mechanics.



Ar = 3,5-di-*tert*-butylphenyl