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Oxidation of Electrostatically Paired Metalloporphyrin/ Metallophthalocyanine Derivatives: Synthetic Models of the "Special Pair" of Bacteriochlorophyll-*b* Molecules in the Photosynthetic Reaction Center

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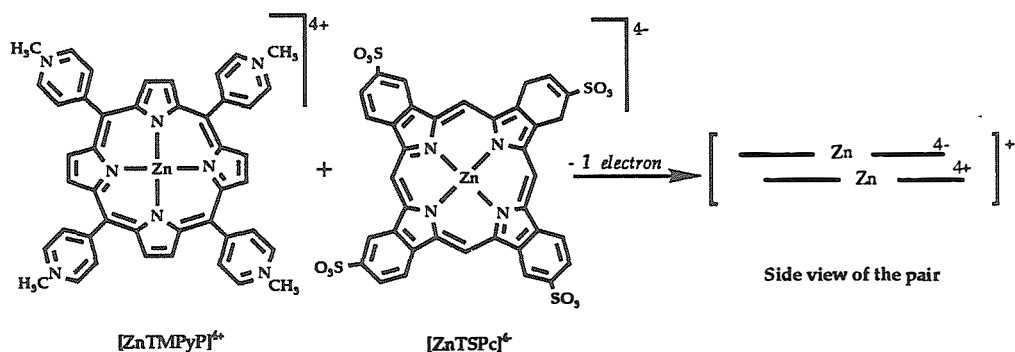
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**OXIDATION OF ELECTROSTATICALLY PAIRED
METALLOPORPHYRIN/METALLOPHTHALOCYANINE
DERIVATIVES: SYNTHETIC MODELS OF THE "SPECIAL PAIR" OF
BACTERIOCHLOROPHYLL-*b* MOLECULES IN THE
PHOTOSYNTHETIC REACTION CENTER.**

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A synthetic approach has been taken to create an isolated molecular system modeling the photoreactive "special pair" responsible for initial electron donation in photosynthesis. The electrostatically paired (tetra(methylpyridyl)porphinato)zinc(II) / (tetrasulfophthalocyaninato)zinc(II) ($[\text{ZnTMPyP}]^{4+} / [\text{ZnTSPc}]^{4-}$) system was chosen since the strong electrostatic attraction of the molecules results in a cofacial arrangement similar to that which allows the single electron oxidation of the natural system.



Using electronic spectroscopy, and analytical electrochemical techniques, the characteristic oxidation potentials, and visible spectra of the novel oxidized associated species may be compared with individually oxidized components. Initial results indicate that the interacting pair may undergo a *single-electron* oxidation to produce a cationic radical pair in which a one-electron vacancy is shared by the two molecules. This characteristic which is indeed seen in the natural bacteriochlorophyll-*b* pair, has thus far been unobserved in synthetic systems.