



Apr 6th, 6:30 PM - 8:00 PM

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

James Caccitolo
Illinois Wesleyan University

John Goodwin, Faculty Advisor
Illinois Wesleyan University

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>

Caccitolo, James and Goodwin, Faculty Advisor, John, "Oxidation of Electrostatically Paired Metalloporphyrin/Metallophthalocyanine Derivatives: Synthetic Models of the "Special Pair" of Bacteriochlorophyll-*b* Molecules in the Photosynthetic Reaction Center" (1990). *John Wesley Powell Student Research Conference*. 7.
<https://digitalcommons.iwu.edu/jwprc/1990/posters/7>

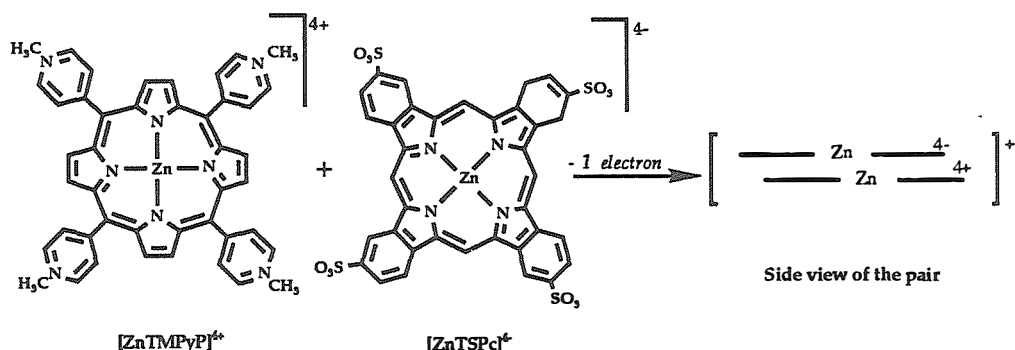
This Event is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

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

James Caccitolo, Dept. of Chemistry, IWU, John Goodwin*

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.