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SYNTHESIS AND CHEMICAL BEHAVIOR OF LAYERED PORPHYRIN

Iwao Tabushi, Noboru Koga, and Kabee Fujita
Faculty of Pharmaceutical Sciences, Kyushu University
Maidashi, Higashi-ku, Fukuoka, Japan

To prepare the titled compound, meso-tetra(o-nitrophenyl)porphyrin was reduced with zinc dust under alkaline condition. In the NMR spectrum of the product, the protons of the porphyrin rings were shielded abnormally (by 8ppm) as compared with those in common porphyrins, strongly suggesting the product to be a kind of layered porphyrins. It is interesting to note that the fluorescence intensity of the layered porphyrin was much weaker than meso- tetraphenylporphyrins.
This observation seems to be explicable by an intramolecular self-quenching of two porphyrins in the layered compound. Magnesium, manganese and zinc complexes of the present layered porphyrin were prepared by the common procedures. The absorption spectra of mono- and di- metal complexes of the layered porphyrin were somewhat different from those of the corresponding metal complexes of meso-tetraphenylporphyrins. Furthermore, magnesium and manganese complexes of the layered porphyrin showed the characteristic absorptions in the near infra-red region (λ_{max} 780,1660,1720,2060, 2390,2550$_{nm}$), while the corresponding metal meso- tetraphenylporphyrins have not any absorptions throughout the region. Such difference in the near infra-red region suggests new type interaction between central metal and two porphyrin rings. The di-manganese (III) complex of the layerd porphyrin was readily oxidized to the manganese (IV) complex by the treatment with NaOCl in the alkaline condition. The recovery of the manganese (III) complex was observed after the treatment of the manganese (IV) complex with dilute hydrochloric acid.