

Suwaluck Chaitong 2012: The Use of 5,10,15,20-Tetra(*p*-bromophenyl)Porphyrin and 5,10,15,20-Tetra(*p*-nitrophenyl)Porphyrin as Chemosensor for Hg²⁺. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Apisit Songsasen, Ph.D. 143 pages.

5,10,15,20-Tetra(*p*-bromophenyl)Porphyrin (TBTPP) and 5,10,15,20-Tetra(*p*-nitrophenyl)Porphyrin (TNPP) were synthesized the reaction of pyrrole with *p*-bromobenzaldehyde and *p*-nitrobenzaldehyde repectively, in the presence of acid catalyst. FT-IR and ¹H NMR were used to identify the structure of synthesized compounds.

TBTPP and TNPP were used as ratiometric fluorescent chemosensor for determining Hg²⁺ attributed to the metalloporphyrin formation of Hg-TBTPP and Hg-TNPP complexes. There were evidences from the experiments such as spectrofluorometry, which showed the occurrence of Hg-TBTPP and Hg-TNPP complexes. The structures of porphyrin ligand and porphyrin complexes were also investigated by using quantum chemical calculation. The results showed that synthesized TBTPP could coordinate with Hg²⁺ as similar as TNPP. However, TBTPP could coordinate with Hg²⁺ better than TNPP, these results were confirmed by the stablily constants and stabilization energy of complexes. The linear range of detections of Hg²⁺ by TBTPP and TNPP were found to be 8-24 μM and 12-27 μM, respectively.

Student's signature

Thesis Advisor's signature