Thesis Title Electrochemical Studies on Speciation of Tin - Amino Acid Complexes

Name Pravitra Chandranupap

Degree Master of Science (Physical Chemistry)

Thesis Supervisory Committee

Waret Veerasai, Dr.rer.nat.

Prapin Wilairat, Ph.D.

Yuwadee Shiowatana, Ph.D.

Date of Graduation 10 July B.E. 2534 (1991)

ABSTRACT

The equilibria of tin (2+) complexes with some amino acids namely, glycine, *dl*-alanine, *l*-phenylalanine and *l*-cysteine were obtained as a representative for the studies of tin (2+)-biomolecules interaction. Tin (2+)-amino acid systems in the medium of 1.0 M KCl at 25°c were studied by means of electrochemical techniques such as potentiometric pH titration and polarography. In potentiometric pH titration, the studies were performed in the tin (2+) to amino acid concentration ratio (M:L) range from 1:50 to 1:1. Low initial concentration of tin (2+) was used in the titration to avoid precipitation in the solution systems. The most reasonable potentiometric pH data were evaluated with the generalized non-linear curve fitting program, MINIQ. The technique and computer program were also confirmed by determining the amino acid protonation constants. The orders of magnitude of the formation constants which obtained from the best fitted potentiometric data in M:L ratio ranges from 1:50 to 1:10 and same complex type, were:

l-cysteine > *dl*-alanine > glycine > *l*-phenylalanine

Polarographic studies were made in the same condition of potentiometric pH titration in order to compare the result of the two different electrochemical techniques. These gave results consistent with potentiometric pH technique in the existence of complex species at the different pH ranges.