



Potentiometric study of pyridine-2,6-bis(monothiocarboxylate) / 1,3,5-triazine-2,4,6-triamine proton-transfer system and its complexation with UO_2^{2+} ion in dioxane/ H_2O solvent

Ardeshir Shokrollahi ^{*a}, *Roghayyeh Aghaei* ^a, *Zahra Malekhosseini* ^a, *Masoud Mirzaei* ^b

^a *Chemistry Department, Yasouj University, Yasouj 75918-79831, Iran*

^b *Department of Chemistry, School of Sciences, Ferdowsi University of Mashhad, Mashhad, Iran*

E-mail: ashokrollahi@mail.yu.ac.ir

Potentiometry is not limited to aqueous solutions, even with the use of the glass electrode. For all practical purposes these alcohol-water or dioxane-water solvents can be treated just like aqueous solutions for potentiometric purposes [1]. In this work the protonation constants of 1,3,5-triazine-2,4,6-triamine (tata) and pyridine-2,6-bis(monothiocarboxylate) (pdtc), the building blocks of the proton-transfer systems (tata) and (pdtc) the stability constants of these systems were determined by potentiometric studies in a dioxane/ H_2O (1:1 v/v) mixture. The stoichiometry and the formation stability constants of complexes formed on reacting pdtc/tata 1:1 molar mixtures with the UO_2^{2+} ion in dioxane/ H_2O (1:1 v/v) were investigated by potentiometric pH titration methods. Ligand protonation constants and stability constants of proton-transfer systems and their complexes with uranyl cation were evaluated using the program BEST described by Martell and Motekaitis [2] The value of the autoprotolysis constant for dioxane/ H_2O (1:1 v/v) solution ($K_s = [H^+][OH^-]$) was calculated according to the literature [2]. For pdtc (L) and tata (Q) – UO_2 systems, the most likely species are: UO_2L , UO_2L_2 , UO_2Q_2 , $UO_2Q_2H_2$ and UO_2QH_1 respectively. The pdtc-tata- UO_2 system the predominant species is: $(UO_2)_2L_2QH_3$. The results of solution study was compared with the obtained of solid state.

Keyword: Potentiometry, tata, pdtc, UO_2^{2+} , dioxane/ H_2O .

References:

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