

Hard-soft interaction of 2-mercaptobenzothiozol with Some metal ions

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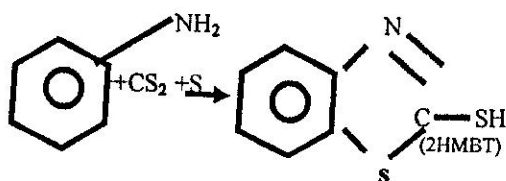
Abstract

Acid dissociation of 2-mercapto benzothiozol (2HMBT) in Dioxane –water mixture at 25 °c was obtained to be 8.3×10^{-8} . stability constants of complexes formed by (2HMBT) with Th^{4+} , UO_2^{++} and Pb^{++} ions were established.

Results obtained indicated that the organic ligand behave as hard base according to pearson's defination ,Hardness-softness parameters for ligand were calculated using Messono's equation,the order of Hardness could be arranged as follows:
 $\text{S}_2\text{O}_3^{-2} < \text{I}^- < \text{Br}^- < \text{phenol} < \text{2HMBT} < \text{Cl}^- < \text{NH}_3 < \text{OH}^-$

Introduction

The compound 2-Mercaptobenzothiozole abriviated as (2-HMBT),have been preparad⁽¹⁾ through the reaction between Aniline ,carben disulphide and sulpher at 250 °c and 450 P.S.I.



The compound (2HMBT) was used as a reagent forming coloured complexes useful for quantitative determination of $\text{Se}(\text{IV})$ ^{2,3,4}, $\text{Os}(\text{III})$ ⁵, $\text{Hg}(\text{II})$ ⁶. Nicked complexes were used in Industry in fixing the colour of Jut fabrics⁽⁷⁾, On the other hand ,Zinc complexes were used as an accelerators in rubber Industry^(8,9) and Tin complexes were used as an antibacterial agents⁽¹⁰⁾. Many other complexes of this ligand have been extensively studid⁽¹¹⁾ all of which were found to be stable at ordinary temperatures.

Pearson's Hard-soft interaction⁽¹²⁾ between the ligand (2HMBT) and

metal ions have not been investigated ,therefor it is the task of the present paper to clarify these aspects and therefor stability constants were suggested to do the task.

Experimental

Materials

B.D.H pure thorium nitrate,urany nitrate and lead nitrate ,Fluka (AG) 2-mercapto benzo thiozole (99.91. purity) were used. Dioxane was used after redistillation a B.D.H analar grade reagent . All solutions were made with deionized water and the carbonate free alkali solutions were standardized against pure potassium hydrogen phthalate¹³.

APPARATUS AND PROCEDURE

pH measurements were made using practironic pH –mater ,equiped with glass electrode and standared silver – silver chloride electrode. The pH – meter was standarized befor each run against buffer solutions of know pH values and was checked at the end of each run.

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