

Transition Metal Chelates of N-Hydroxy-N-Phenyl -N'-p-Anisoyl Benzamidine

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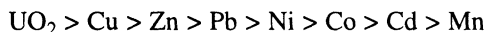
The present work is a brief report on complexing behaviour of N-hydroxy-N-Phenyl-N'-p-anisoyl-benzamidine with $UO_2(II)$, $Cu(II)$, $Pb(II)$, $Zn(II)$, $Co(II)$, $Cd(II)$ and $Mn(II)$.

A survey of the literature reveals that the N-hydroxy benzamidine have widely been studied as analytical reagents¹⁻⁵. The purpose of the present investigation is to study of complexing behaviour of N-hydroxy-N-phenyl-N'-p-anisoyl-benzamidine with bivalent transition metals viz., $UO_2(II)$, $Cu(II)$, $Pb(II)$, $Zn(II)$, $Co(II)$, $Cd(II)$ and $Mn(II)$. The stepwise and overall stability constants of these chelates have been determined by the Irving-Rossotti titration technique⁶.

N-hydroxy-N-phenyl-N'-p-anisoyl-benzamidine was prepared⁷ by condensing equimolar quantities of N-p-anisoyl benzimidoyl chloride and N-phenyl hydroxylamine at 0°C. The crude hydrochloride thus obtained was treated with aqueous ammonia to precipitate a pale yellow compound. The compound was filtered, washed with water and recrystallized from acetone (60-80°C) and benzidene mixture (1: 2 v/v).

Solution of transition bivalent metal ions were prepared either from sulphates and nitrates and solutions were standardized by conventional gravimetric methods. Sodium perchlorate was used to maintain the ionic strength (0.1M). Dioxane analar (BDH) was freed from peroxide by refluxing it with sodium wire for 24 h. and was distilled over sodium before use. The study was carried out in a 40% dioxane-water mixture because of solubility considerations. Tetramethyl ammonium hydroxide was used as titrant.

N-hydroxybenzamidine are known to act as bidentate ligands and to form chelates with metal ions. Since only 1 : 1 and 1 : 2 (metal : ligand) complexes were formed in the systems under study, *Correction term method* of Irving and Rossotti was used for computing the stability constant from the formation curves. The values of stepwise and overall stability constants are given in Table 1. The trend of stability constants of 1 : 1 transition bivalent metal complexes with N-hydroxy-N-phenyl-N'-p-anisoyl benzamidine is found to be:



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TABLE I
STABILITY CONSTANTS OF TRANSITION BIVALENT METAL CHELATES
WITH N-HYDROXY-N-PHENYL-N'-p-ANISOYLBENZAMIDINE

Metal Ion	log K ₁	log K ₂
UO ₂ (II)	8.64	6.98
Cu(II)	7.02	6.84
Zn(II)	6.11	5.76
Pb(II)	5.98	5.12
Ni(II)	5.74	4.24
Co(II)	5.22	3.98
Cd(II)	4.32	3.62
Mn(II)	4.14	3.34

The order is in agreement with the general Irving and Williams order of stability of metal chelates.

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REFERENCES

1. K.K. Deb and R.K. Mishra, *Curr. Sci. (India)*, **45**, 134 (1976); **47**, 341 (1978).
2. K. Satyanarayana and R.K. Mishra, *J. Indian Chem. Soc.*, **55**, 787 (1978).
3. K.S. Patel and R.K. Mishra, *Bull. Chem. Soc. Japan*, **52**, 595 (1979).
4. R.S. Kharsan and R.K. Mishra, *J. Indian Chem. Soc.*, **56**, 535 (1979).
5. R.S. Kharsan, K.S. Patel and R.K. Mishra, *Indian J. Chem.*, **19A**, 499 (1980).
6. H.M. Irving and H.M. Rossotti, *J. Chem. Soc.*, 2904 (1954).
7. R.D. Jaiman, Ph.D. Thesis, Rajasthan University, Jaipur, India.
8. H. Irving and R.J.P. Williams, *Nature*, **162**, 746 (1948).

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