

STUDIES ON MIXED HALOANTIMONATES (III)

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CERTIFICATE

This is to certify that thesis entitled " Studies on Mixed Haloantimonates(III)", being submitted by Miss Amrita Kumari to the Indian Institute of Technology, Delhi, for the award of the degree of Doctor of Philosophy in Chemistry, is a record of bonafide research work carried out by her. Miss Amrita Kumari has worked under my guidance and supervision and has fulfilled the requirements for the submission of her thesis.

The results contained in this thesis have not been submitted, in part or full, to any other University or Institute for the award of any degree or diploma.



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ABSTRACT

The present work reports the isolation and characterization of some mixed haloantimonates(III) which include mixed tetra-, mixed penta-, and mixed hexahaloantimonates(III) and also mixed nonahalodiantimonates(III). These complexes have been characterized by i.r., far i.r., and u.v. spectral studies, conductance measurements, x-ray powder diffraction and thermogravimetric analysis (T.G.A.)

The i.r. data (4000-400 cm^{-1}) have confirmed the presence of cations in these complexes and also (Sb-F) stretches in the fluorohaloantimonates(III). In general, the spectral assignments in far i.r. region (400-50 cm^{-1}) for mixed tetra-, mixed penta-, and mixed hexahaloantimonates(III) have been made on the basis of distorted tetrahedral, square pyramidal and slightly distorted octahedral geometries, respectively. The electronic spectral data have been interpreted on the basis of $d^{10}s^2$ model. Molar conductance values at $\sim 10^{-3}$ M in different solvents have shown that these tetra-, penta-, and hexahaloantimonates(III) behave as 1:1, 1:2 and 1:3 electrolytes respectively. In case of mixed tetrahaloantimonates(III) Debye-Hückel-Onsager equation has been used to confirm them to be 1:1 electrolytes. Unit cell dimensions for two mixed haloantimonates(III) have been found out from x-ray powder diffraction data. T.G.A. study has indicated that all the complexes behave in a similar manner showing one step decomposition.

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