

PREFACE

The work described in this thesis entitled "Studies in Transition Metal Chemistry and Electrochemistry" originated from an attempt to explore the effect of substituents present in a ligand on the redox potentials of transition metal ions. The metals involved are iron, cobalt, copper and ruthenium. The ligands used in our work are primarily triazene 1-oxides ($R N(O)=N-NHAr$) with O,N coordination centers. The secondary ligands include 2,2'-bipyridine and 2-(phenylazo)pyridine both with N, N donor centers. Spectroscopic, electrochemical and several other techniques have been used to characterize the species. Emphasis is given on the electrochemical techniques.

The thesis consists of eight chapters. A brief survey of known chelate-chemistry of triazene 1-oxides, the basis of the various electrochemical techniques used is outlined in Chapter I along with the purpose of the present investigation. The electron transfer properties of tris iron(III), cobalt(III) (Chapter II) and bis copper(II) (Chapter III) triazene 1-oxides are described. This is followed by a chapter on the mixed ligand triazene 1-oxide chelates. Thermodynamic considerations pertinent in the electron transfer of iron(III), cobalt(III) and copper(II) are examined in Chapter V. In Chapter VI tris ruthenium(III)

triazene 1-oxides are described. In next two chapters ruthenium(II) chelates of 2,2'-bipyridine-triazene 1-oxides (Chapter VII) and 2-(phenylazo)pyridine-triazene 1-oxides (Chapter VIII) are presented.

The present work was initiated in February, 1980 in the Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta, under the supervision of Professor A. Chakravorty.

In keeping with the general practice of reporting scientific observations, due acknowledgement has been made for the works described as based on the findings of other investigators. I must take the responsibility of any unintentional oversights and errors which might have crept in in spite of precautions.

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