PREFACE

The dissertation deals with polarographic studies of the reduction of N-(Benzene Sulfonyl)-3-methyl-4-(2-substituted aryl hydrazono)-pyrazolin-5-one. The reduction of the organic compounds at the dropping mercury electrode can be visualised as a nucleophilic reaction, if electron is considered as nucleophile. This nucleophilic reaction is susceptible to change in (a) acid base equilibria and (b) the temperature of the system. Hence the polarographic reduction of

i) N-(Benzene sulfonyl)-3-methyl-4-(benzene hydrazono)-pyrazolin-5-one

ii) N-(Benzene sulfonyl)-3-methyl-4-(2-methyl benzene hydrazono)-pyrazolin-5-one

iii) N-(Benzene sulfonyl)-3-methyl-4-(2-methoxy benzene hydrazono)-pyrazolin-5-one

iv) N-(Benzene sulfonyl)-3-methyl-4-(2-hydroxy benzene hydrazono)-pyrazolin-5-one

v) N-(Benzene sulfonyl)-3-methyl-4-(2-chloro benzene hydrazono)-pyrazolin-5-one

vi) N-(Benzene sulfonyl)-3-methyl-4-(2-nitro benzene hydrazono)-pyrazolin-5-one

have been studied in detail. Studies on these reagents are taken up since some of them have been widely used in these laboratories or elsewhere as organic, analytical reagents for the detection and determination of a number of metal ions by polarographic, amperometric, extraction polarographic, conductometric, gravimetric, volumetric and spectrophotometric techniques. These reagents are also employed for the synthesis and characterization of metal complexes through analytical, magnetic moment, IR, ESR, mass, HNMR spectral measurements.

The entire dissertation is divided into two parts A and B, with two chapters in part A and two chapters in part B as detailed below.
Part A General introduction

Chapter - I

Basic principles of polarography

This chapter deals with basic principles involved in the polarography technique and the use of polarography for the elucidation of electron reduction mechanism.

Chapter - II

Experimental

Some details about the preparation of the solutions used, the description of the instruments employed and the general polarographic and cyclic voltammetric procedures followed are described in latter part of the chapter.

Part - B Synthesis, Characterisation and Electro-chemical studies of N-(benzene sulfonyl) - 3-methyl -4-(2'-substituted aryl hydrazono)-pyrazolin-5-ones

Chapter - III Synthesis, Characterisation and Electro-chemical studies

The details regarding a synthesis, characterisation and polarographic behaviour of N-(benzene sulfonyl) - 3-methyl -4-(2'-substituted aryl hydrazono)-pyrazolin-5-ones are presented at the beginning of the chapter.

The results and discussions relating to the polarographic behaviour of

i) N-(Benzene sulfonyl)-3-methyl-4-(benzene hydrazono)-pyrazolin-5-one

ii) N-(Benzene sulfonyl)-3-methyl-4-(2'-methyl benzene hydrazono)-pyrazolin-5-one
iii) N-(Benzene sulfonyl)-3-methyl-4-(2-methoxy benzene hydrazono)-pyrazolin-5one  
iv) N-(Benzene sulfonyl)-3-methyl-4-(2-hydroxy benzene hydrazono)-pyrazolin-5one  
v) N-(Benzene sulfonyl)-3-methyl-4-(2-chloro benzene hydrazono)-pyrazolin-5one  
vi) N-(Benzene sulfonyl)-3-methyl-4-(2-nitro benzene hydrazono)-pyrazolin-5one  

at different pHs, at different temperatures and effect of substituent on the polarographic behaviour are presented in this chapter.

**Chapter IV Cyclic voltammetric studies of N-(benzene sulfonyl) - 3-methyl -4-(2-substituted aryl hydrazono)-pyrazolin-5-ones**

In general, except in few cases the number of peaks observed in cyclic voltammetry is similar to the number of waves observed in DC polarography. The peak potential shifts to more negative values with increase in the sweep rate. The compounds fail to exhibit the anodic peak in the reverse scan. In general the results of cyclic voltammetric studies substantiate the results obtained in polarographic studies.