SYNOPSIS
SYNOPSIS

The synthesis of orthomercaptoazo compounds originates back to 1950 and owes mostly to the work initiated by A. Burawoy in the University of Manchester which has been extended later on by different groups including the one headed by Dr. (Mrs.) A. Choudhury and Dr. S.K. Bhattacharjee in the University of Gauhati. Since then, a number of azobenzene sulphenyl compounds have been synthesized and their reactions studied. But only a few corresponding compounds of naphthalene series have been prepared. The present work is, therefore, undertaken to synthesize a substituted arylazonaphthalene sulphenyl bromide and to study the reactions of the compound vis a vis its structure with different compound classes. A comparative study of the physical and chemical properties of the sulphenyl bromides of azonaphthalene series has been made with the newly synthesized compound wherever possible.

The entire work has been divided into seven chapters. A brief review of the relevant works
done earlier is included in each chapter. In the results and discussion part of each chapter, the present work done on the subject is discussed and the data pertaining to uv and visible, ir, nmr and mass spectrometric analysis for characterization of the compounds are presented. The experimental section of each chapter deals with the experimental details of the work involved in the preparation of the compounds and study of the reactions with different compound classes.

CHAPTER-I :

This chapter includes the synthesis of 2-(2'-nitro-4'-chlorophenylazo)-naphthalene-1-sulphenyl bromide and the corresponding tribromide by different routes. Uv and visible, ir and mass spectra of the synthesized compound are discussed.

CHAPTER-II :

The physical characteristics of 2-aryazoarene sulphenyl bromides including the newly synthesized 2-(2'-nitro-4'-chlorophenylazo)-naphthalene-1-sulphenyl bromide have been discussed in this chapter.
From the uv and visible spectra of these compounds, an attempt has been made to interpret their structures in solution. Thermal properties of the newly synthesized sulphenyl bromide are studied by differential scanning calorimetry and a comparative study has been made with a compound of azobenzene series having similar substitution in the arylazo moiety. From this study, stability of the compounds can be predicted.

Conductance measurements are carried out to ascertain the electrolytic nature of the sulphenyl bromide. The curve obtained by plotting equivalent conductance ($\Lambda$) against the square root of molar concentration ($\sqrt{c}$) is presented, the nature of which shows that the compound is a weak electrolyte.

Chromatographic behaviour of 2-arylazoarene sulphenyl bromides has been studied by hptlc with scanning densitometry and hplc. From the nature of separation, differentiation can be made between the two compound classes of azobenzene and azonaphthalene series.
CHAPTER-III

This chapter deals with the solvolysis and alkaline hydrolysis reactions of 2-arylazonaphthalene sulphenyl bromides. The distinctive solvolytic behaviour of the newly synthesized sulphenyl bromide from the other compounds of the series has been discussed. Different hydrolytic reaction products obtained from the alkaline hydrolysis of sulphenyl bromides are reported.

CHAPTER-IV:

The sulphenylation reactions of an unsymmetrical ketone and an active methylene compound with the sulphenyl bromides have been discussed in this chapter. The synthesis of naphthothiazoles from the β-ketothioethers has also been discussed in this chapter.

CHAPTER-V:

The addition reactions of 2-arylazo naphthalene sulphenyl bromides with olefins are included in this chapter. β-bromothioethers as the Markownikoff
adduct is the major product obtained from the reaction of sulphenyl bromides with the olefins styrene and cyclohexene.

CHAPTER-VI:

The thioarylation reactions of sulphenyl bromides with active aromatic substrates are discussed in this chapter. It has been observed that the thioarylation reactions result in mostly the ring sulphenylated products. Uv and visible, ir and nmr spectra of the reaction products are presented.

CHAPTER-VII:

In this chapter, the sulphenylation reactions of amino acids with the newly synthesized sulphenyl bromide have been discussed. The products involving the reaction of sulphenyl bromide with a sulphur containing amino acid (cysteine), a phenolic amino acid (tyrosine) and a heterocyclic amino acid (tryptophan) have been described. The regeneration of amino acid from the reaction product is also discussed.
Sulphenylation reactions of dipeptides with the sulphenyl bromide are also included in this chapter. The availability of additional nucleophilic site other than the \(-\text{NH}_2\) group in the dipeptides makes the reaction selective. The reaction products obtained from the sulphenylation reaction of the dipeptides are described in this chapter.