

## P R E F A C E

The work presented in this thesis deals with a systematic investigation on the 'metachromasy' of some thiazine dyes, especially of some higher derivatives, from various aspects. Thus interaction of these dyes with electrolytes, organic and inorganic, with solvents of varying dielectric constants, with polyelectrolytes and clay minerals and also solubilisation of the dyes in respect to various surfactants have been dealt with.

The thiazine dyes selected for the purpose of this study are trimethyl propyl thionine (TMPT), trimethyl butyl thionine (TMBT), diethyl methyl propyl thionine (DEMPT) and diethyl methyl butyl thionine (DEMBT) with a distinct difference in sizes but quiet similarity in structures. The organic electrolytes used are chiefly the quaternary ammonium salts whereas the polyelectrolytes for the purpose are sodium polystyrene sulfonate and polyacrylic acid which possess different anionic sites, chain length and structure. The natural clay minerals viz. montmorillonite and vermiculite and one synthetic exchanger viz. Laponite (a hectorite) have been used to study the spectral changes due to interactions of the thiazine dyes with clay minerals. A systematic attempt has been made to interpret the data of these studies in the light of prevalent approaches and models and also to express the data in qualitative and partly in quantitative terms.

The critical micelle concentrations of three surfactants viz., sodium dodecyl sulfate (SDS), sodium heptadecyl sulfate

(NHS) and dodecyl benzene sodium sulfonate (DBSS) have been determined by the method of dye solubilisation. The limit of solubilisation of the thiazine dyes on these surfactants have also been determined. The effects of chain length and structures imposed on the values of these parameters have been interpreted in terms of the latest model available.

The present dissertation is the result of research carried out at the Department of Chemistry, University of North Bengal.