

P R E F A C E

The material included in the thesis is an account of our investigation on aqueous suspensions of clay minerals and two other polyfunctional ion-exchangers. The contents may be broadly divided into two parts:

- (I) Equilibrium behavior of some exchangeable cations in different exchange-systems.
- (II) Polarographic behavior of the exchangeable ions and also of the exchangers impregnated with electroreducible ions.

Qualitative also quantitative approaches, theoretical models and appropriate formulations have been used to understand the ion-exchange equilibria. For different processes under consideration, thermodynamic quantities such as equilibrium constant K , free energy change ΔF , enthalpy change ΔH , entropy change ΔS and activity coefficients of ions in the exchanger-phase have been evaluated on the basis of the above.

The polarographic work on fine suspensions of the aforesaid exchangers forms a significant part of the present investigation.

This versatile technique has been shown to afford useful information about the exchangers and the participating ions in the exchange process.

Materials partly presented in Chapters IV - VIII have been presented at Conventions of Chemists, 1969 & 70 and at the Physical Chemistry Section of Indian Science Congress 1970 & 1971. The details are given below:

- (1) "Aspects of equilibrium in a heterogeneous phase system.

Part I Polarographic attempt to determine exchange capacity"

Abstract 69-P-70, P-57
Convention of Chemists, 1969.

- (2) "Exchange of thallium by H-Montmorillonite and its dependence on temperature"

Abstract P-41-70, P-107
Convention of Chemists, 1970.

- (3) "Polarographic study on ion-exchangers in suspension"

Abstract 3.2.7. P. 112, Pt III,
Proceedings of 57th session, Indian Science
Congress Association.

- (4) "Interaction of thallium (1) Chloride and thallium (1) perchlorate with different exchangers in H-forms"

Abstract 3.2.8. P. 166, Pt III,
Proceedings of 58th session, Indian Science
Congress Association.

The following paper has been accepted for publication in Indian Journal of Applied Chemistry:

"Behaviour of hydrated alumina as tribasic acid".