

## Preface

The material included in the thesis is an account of the research carried out by the candidate under the supervision of Dr. S.K. Chakravarti, former Professor of Chemistry, University of North Bengal, Darjeeling, West Bengal.

The thesis has been divided into two parts:

Part I - Characterisation of some Soils of the Eastern Himalayan Region.

Part II - An Attempt of Separation of Components of Artificial and Natural Clay Mixtures.

Part I includes some useful information of the hill soils of North Bengal and Sikkim. Emphasis has been given to study the physicochemical characteristics, NPK and micronutrient status, humic substances and clay minerals as functions of altitude and climatological conditions. It may be mentioned that a paper entitled "Characterisation of Some Soils of Sikkim at Varying Altitudes" has been accepted for publication in the Journal of the Indian Society of Soil Science which comprises of the essential part of the matter presented in Chapter 4 and 5.

In Part II are presented experiments aimed at separation of the component clay minerals from artificial mixtures of bentonite and kaolinite, bentonite and alumina and of natural clays. The

flocculation and deflocculation characteristics of organo-clay complexes as well as their organophilic behaviour have been utilised for the separation of component clay minerals of binary mixtures. For this purpose systematic studies on electrochemical measurements, base exchange capacity, viscometry, sedimentation volume, adsorption of organic compounds, swelling and organophilic behaviour of organo-clay complexes of the pure clay minerals and their binary mixtures have been made from both qualitative and quantitative standpoints.

The candidate is thankful to the Department of Environment, Govt. of India, for awarding a Junior Research Fellowship and also to the Head of the Department of Chemistry and the authorities of the University of North Bengal for laboratory facilities.

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The candidate takes this opportunity to express his indebtedness to his mother and elder brothers and sisters for their utmost care and affection in his academic pursuit.

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