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Preface

The papers in this volume were presented at an international symposium on Topics in Surface Chemistry which was held in Bad Neuenahr, West Germany, September 7-9, 1977. The symposium was sponsored by IBM Germany.

It has been recognized for many years that our understanding of bulk phenomena and their subsequent exploitation depends largely on our ability to define correlations between microscopic structure and the physical and chemical phenomena of interest.

The role played by surface phenomena in the overall behavior of a material has been a subject for speculation for a long time, but only during the last decade or so have experimental and theoretical tools been developed which make it possible to investigate surface structure and related surface phenomena uniquely.

Numerous surface spectroscopies have been developed in recent years intended to describe the geometric, vibrational and electronic structure of a surface. Our present understanding of surface, thin film and interfacial phenomena in solid state physics owes much to these developments. In chemistry much of the interest in surface science has come from the obvious implications to such important and diverse fields as catalysis and corrosion. It takes little imagination to recognize that there are many other areas where advances in surface science can be brought to bear.

It was the purpose of this IBM sponsored conference to bring together key scientists, particularly from Europe, who, though active in quite diverse fields, appear to be asking related questions about the role of surface structure and phenomena as encountered in their particular fields of interest.

The motivation for the conference was to explore common ground, especially in chemical aspects of surface and interfacial phenomena. A conscious effort was made to intersect but also go beyond topics covered by other chemically oriented surface confer-

ences, most of which had been motivated historically by the wide interest in catalysis.

Five distinct fields were represented at the conference. The sessions on "Fundamental Aspects of Surface Chemical Bonding" and "Optical Excitations at Surfaces" examined recent progress in understanding surface electronic and vibrational structure, including structure of sorbed species. Photoelectron Spectroscopy, High Resolution Energy Loss Spectroscopy, Surface Raman Spectroscopy, as well as Attenuated Total Reflection and Surface Photovoltage Spectroscopy, were discussed. Both inorganic and organic systems were considered. The session on "Atomic and Molecular Scattering from Surfaces" took cognizance of the fact that ultimately any real understanding of surface chemistry at a gas-surface interface must include a detailed description of energy partitioning and the dynamics of surface scattering processes. The session on "Surface Studies in Electrochemical Systems" dealt with interfacial electrochemical phenomena and explored contemporary chemical and physical approaches designed to study and control electron transfer at such solid-liquid interfaces. The session on "Ordered Array of Organic Molecules at Surfaces and Interfaces" explored some very exciting chemical and physical characteristics of complex organic molecules cast into well-defined monolayer assemblies and also encountered in micellar structures.

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