

# CONTENTS

CHAPTER	Page
1. <sup>*</sup> PHYSICAL ADSORPTION, <i>Herman E. Ries, Jr.</i> .....	1
Introduction.....	1
Experimental Methods.....	3
Theories of Physical Adsorption.....	6
Capillary Condensation and Pore Structure.....	22
2. MEASUREMENT OF THE SURFACE AREA OF SOLID CATALYSTS, <i>Paul H. Emmett</i> .....	31
Introduction.....	31
Surface Area Measurements by Low-Temperature Gas Adsorption Methods.....	32
Critique of the Measurement of Surface Areas by Gas Adsorption Methods.....	46
Application of Surface Area Measuring Methods in the Study of Solid Catalysts.....	53
Other Methods for Measuring the Surface Areas of Finely Divided and Porous Solids.....	57
Summary.....	69
3. CHEMISORPTION, <i>Keith J. Laidler</i> .....	75
The Data of Chemisorption.....	86
Ideal Adsorption.....	90
Statistical Treatment of Ideal Adsorption.....	93
Surface Heterogeneity.....	101
Interaction Between Adsorbed Molecules.....	105
Thermodynamics of Chemisorption.....	114
4. KINETIC LAWS IN SURFACE CATALYSIS, <i>Keith J. Laidler</i> ....	119
Basic Kinetic Laws.....	119
Mechanism of Surface Catalysis.....	127
Kinetic Laws for Unimolecular Reactions.....	130
Discussion of Experimental Data on Unimolecular Reac- tions.....	137
Kinetic Laws for Bimolecular Reactions.....	151
Discussion of Experimental Data on Bimolecular Reac- tions.....	159
Special Types of Reactions.....	176

Kinetics in the Case of Interactions Between Adsorbed Molecules.....	188
The Time Course of Surface Reactions.....	188
5. THE ABSOLUTE RATES OF SURFACE REACTIONS, <i>Keith J. Laidler</i> .....	
Theory of Absolute Reaction Rates.....	195
Absolute Rates of Adsorption.....	196
The Parahydrogen Conversion on Tungsten.....	210
Unimolecular Reactions.....	211
Interaction Between an Adsorbed Molecule and a Gaseous Molecule.....	217
Some Special Reactions.....	219
Activation Energies of Surface Reactions.....	234
Kinetics in the Case of Interactions Between Adsorbed Molecules.....	239
6. CATALYST CARRIERS, PROMOTERS, ACCELERATORS, POISONS, AND INHIBITORS, <i>W. B. Innes</i> .....	
Catalyst Carriers.....	245
Promoters.....	272
Accelerators.....	281
Poisons.....	299
Inhibitors.....	307
7. CATALYST PREPARATION, <i>F. G. Ciapetta and C. J. Plank</i> .....	
General Techniques of Catalyst Preparation.....	315
Catalyst Preparation—Literature References.....	324
Catalyst Preparation—Experimental.....	340
8. MAGNETISM AND CATALYSIS, <i>P. W. Selwood</i> .....	
Introduction.....	353
Theories of Magnetism.....	354
Application of Magnetic Susceptibilities to Catalyst Structure.....	359
Thermomagnetic Analysis.....	366
Experimental Methods.....	372
Author Index.....	
Subject Index.....	