

|                         |   |
|-------------------------|---|
| 1. Record Nr.           | UNINA9910784570203321   |
| Autore                  | Rouquerol Francoise   |
| Titolo                  | Adsorption by powders & porous solids [[electronic resource] ] : principles, methodology and applications / / Francoise Rouquerol, Jean Rouquerol and Kenneth Sing  |
| Pubbl/distr/stampa      | San Diego, : Academic Press, c1999  |
| ISBN                    | 1-281-05706-1<br>9786611057060<br>0-08-052601-2   |
| Descrizione fisica      | 1 online resource (485 p.)  |
| Altri autori (Persone)  | RouquerolJ (Jean)<br>SingK. S. W  |
| Disciplina              | 541<br>541.3/3 21<br>541.33   |
| Soggetti                | Surface chemistry<br>Adsorption<br>Powders - Surfaces   |
| Lingua di pubblicazione | Inglese   |
| Formato                 | Materiale a stampa  |
| Livello bibliografico   | Monografia  |
| Note generali           | "Centre de Thermodynamique et de Microcalorimetrie du CNRS and Universite de Provence, 26 rue du 141 eme RIA 13003 Marseille, France."--Title page.   |
| Nota di bibliografia    | Includes bibliographical references and indexes.  |
| Nota di contenuto       | Front Cover; Adsorption by Powders and Porous Solids: Principles, Methodology and Applications; Copyright Page; Contents; Preface; List of Main Symbols; Chapter 1. Introduction; 1.1. Importance of adsorption; 1.2. Historical aspects; 1.3. General definitions and terminology; 1.4. Physisorption and chemisorption; 1.5. Adsorption interactions; 1.6. Mobility of adsorbed molecules; 1.7. Energetics of physisorption; 1.8. Types of adsorption isotherms; 1.9. Molecular modelling of adsorption; References; Chapter 2. Thermodynamics of Adsorption at the Gas-Solid Interface; 2.1. Introduction<br>2.2. Quantitative expression of adsorption<br>2.3. Thermodynamic potentials of adsorption; 2.4. Thermodynamic quantities related to the adsorbed states in the Gibbs representation; 2.5. Thermodynamic quantities related to the adsorption process; 2.6. Indirect derivation of |

the quantities of adsorption from a series of experimental physisorption isotherms: the isosteric method; 2.7. Derivation of the adsorption quantities from calorimetric data; 2.8. Methods for the determination of differential enthalpies of adsorption; References; Chapter 3. Methodology of Adsorption at the Gas-Solid Interface 3.1. Introduction3.2. Basic aspects of methodology; 3.3. Operational procedures; 3.4. Details of the operational stages; References; Chapter 4. Interpretation of Physisorption Isotherms at the Gas-Solid Interface; 4.1. Introduction; 4.2. Physisorption isotherms on non-microporous solids; 4.3. Phase changes in physisorbed layers; 4.4. Physisorption by microporous solids; 4.5. Conclusions; References; Chapter 5. Adsorption at the Liquid-Solid Interface: Thermodynamics and Methodology; 5.1. Introduction; 5.2. Energetics of immersion of solid in pure liquid; 5.3. Adsorption from liquid solution ReferencesChapter 6. Assessment of Surface Area; 6.1. Introduction; 6.2. The BET method; 6.3. Empirical methods of isotherm analysis; 6.4. Adsorption from solution; 6.5. Immersion microcalorimetry; 6.6. The fractal approach; References; Chapter 7. Assessment of Mesoporosity; 7.1. Introduction; 7.2. Capillary condensation and the Kelvin equation; 7.3. Mesopore volume, porosity and mean pore size; 7.4. Computation of the mesopore size distribution; 7.5. Hysteresis loops; 7.6. Density functional formulation; References; Chapter 8. Assessment of Microporosity; 8.1. Introduction 8.2. Isotherm analysis8.3. Microcalorimetric methods; 8.4. Modelling micropore filling: theory and simulation; References; Chapter 9. Adsorption by Active Carbons; 9.1. Introduction; 9.2. Formation and structure of carbon blacks; 9.3. Physisorption of gases by carbon black and graphite; 9.4. Carbonization and activation; 9.5. Physisorption of gases by activated carbons; 9.6. Immersion microcalorimetry and adsorption from solution; References; Chapter 10. Adsorption by Metal Oxides; 10.1. Introduction; 10.2. Physisorption of gases by silica powders and gels 10.3. Aluminas: structure, texture and physisorption

---

#### Sommario/riassunto

The declared objective of this book is to provide an introductory review of the various theoretical and practical aspects of adsorption by powders and porous solids with particular reference to materials of technological importance. The primary aim is to meet the needs of students and non-specialists, who are new to surface science or who wish to use the advanced techniques now available for the determination of surface area, pore size and surface characterization. In addition, a critical account is given of recent work on the adsorptive properties of activated carbons, oxides, clays and zeoli

---