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1.4. Thermodynamic study of physical adsorption1.4.1. The different models of adsorption; 1.4.2. The Hill model; 1.4.3. The Hill-Everett model; 1.4.4. Thermodynamics of the adsorption equilibrium in Hill's model; 1.4.4.1. Formulating the equilibrium; 1.4.4.2. Isotherm equation; 1.4.5. Thermodynamics of adsorption equilibrium in the Hill-Everett model; 1.5. Physical adsorption isotherms; 1.5.1. General points; 1.5.2. Adsorption isotherms of mobile monolayers; 1.5.3. Adsorption isotherms of localized monolayers; 1.5.3.1. Thermodynamic method; 1.5.3.2. The kinetic model
1.5.4. Multilayer adsorption isotherms1.5.4.1. Isotherm equation; 1.6. Chemical adsorption isotherms; 1.7. Bibliography; Chapter 2. Structure of Solids: Physico-chemical Aspects; 2.1. The concept of phases; 2.2. Solid solutions; 2.3. Point defects in solids; 2.4. Denotation of structural members of a crystal lattice; 2.5. Formation of structural point defects; 2.5.1. Formation of defects in a solid matrix; 2.5.2. Formation of defects involving surface elements; 2.5.3. Concept of elementary hopping step; 2.6. Bibliography; Chapter 3. Gas-Solid Interactions: Electronic Aspects
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3.5.4. Case of materials with point defects3.5.4.1. Metal oxides with anion defects, denoted by MO1-x; 3.5.4.2. Metal oxides with cation vacancies, denoted by M1-xO; 3.5.4.3. Metal oxides with interstitial cations, denoted by M1+xO; 3.5.4.4. Metal oxides with interstitial anions, denoted by MO1+x; 3.6. Bibliography; Chapter 4. Interfacial Thermodynamic Equilibrium Studies; 4.1. Introduction; 4.2. Interfacial phenomena; 4.3. Solid-gas equilibriums involving electron transfers or electron holes; 4.3.1. Concept of surface states; 4.3.2. Space-charge region (SCR); 4.3.3. Electronic work function
4.3.3.1. Case of a semiconductor in the absence of surface states

Sommario/riassunto

Fundamental elementary facts and theoretical tools for the interpretation and model development of solid-gas interactions are first presented in this work. Chemical, physical and electrochemical aspects are presented from a phenomenological, thermodynamic and kinetic point of view. The theoretical aspects of electrical properties on the surface of a solid are also covered to provide greater accessibility for those with a physico-chemical background. The second part is devoted to the development of devices for gas detection in a system approach. Methods for experimental investigations concernin