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| Nota di contenuto | Reaction Diffusion and Solid State Chemical Kinetics; Summary; Preface; Introductory Note; Table of Contents; Table of Contents; 1. Formation of a Chemical Compound Layer at the Interface of Two Elementary Substances; 1.1 Description of the Kinetics of Solid-State Heterogeneous Reactions; 1.2 Reaction Diffusion; 1.3 Growth of the Apbq Layer at the Expense of Diffusion Ofcomponent B; 1.4 Growth of the ApBq Layer at the Expense of Diffusion of Components A and B; 1.5 Linear Growth of the Cu6Sn5 Layer in the Copper-Tin Reaction Couple 1.6 Parabolic Growth of the AlSb Layer in the Aluminium-Antimonydiffusion Couple1.7 Linear-Parabolic Growth of the SiO2 Layer between Silicon and Oxygen; 1.8 Growth Kinetics of the NiBi3 Layer at the Nickel-Bismuth Interface; 1.9 Interconnection between the Reaction- and Self-Diffusioncoefficient of the Components of a Chemical Compound; 1.10 Single Compound Layer: Short Conclusions; 2. Growth Kinetics of Two Compound Layers between Elementary Substances; 2.1 Partial Chemical Reactions at Phase Interfaces 2.2 A System of Differential Equations Describing the Rates of Formation of Two Chemical Compound Layers2.3 Initial Linear Growth of the ApBq and ArBs Layers; 2.4 Minimal Thickness of the ArBs Layer Necessary for the ApBq Layer to Occur; 2.5 Non-Linear Growth of the ApBq Layer; 2.6 Effect of the Critical Thickness of the ApBq Layer with |

Regard to Component A on the Process of Growth of the ArBs Layer; 2.7 Paralinear Growth Kinetics of Two Compound Layers; 2.8 Diffusion Controlled Growth of the ApBq and ArBs Layers; 2.9 Nibi Layer: Missing or too Thin?
2.10 Two Compound Layers: Short Conclusions3. Occurrence of Multiple Compound Layers at the a-b Interface; 3. Occurrence of Multiple Compound Layers at the a-b interface; 3.1 Chemical Reactions at Phase Interfaces in a Multiphase Binary System; 3.2 A System of Differential Equations Describing the Growth Process of Three Chemical Compound Layers between Elementary Substances A and B; 3.3 Initial Linear Growth of Three Compound Layers; 3.4 Transition from Linear to Non-Linear Layer-Growth Kinetics; 3.5 Critical Values of Compound-Layer Thicknesses and their Influence on Layer-Growth Kinetics
3.6 Diffusional Stage of Formation of Compound Layers3.7 Sequence of Compound-Layer Formation at the A-B Interface; 3.8 Formation of Intermetallic Layers in Ni-Zn and Co-Zn Diffusion Couples; 3.9 Multiple Compound Layers: Short Conclusions; 4. Growth Kinetics of the same Chemical Compound Layer in Various Reaction Couples of a Multiphase Binary System; 4.1. Growth of the ArBs Layer in the A-B Reaction Couple; 4.2 Growth of the ArBs Layer in the ApBq-B Reaction Couple; 4.3 Growth of the ArBs Layer in the ApBq -AlBn Reaction Couple
4.4 Comparison of the Growth Rates of the ArBs Layer in Various Reaction Couples of the A-B Multiphase Binary System

Sommario/riassunto

This monograph deals with a physico-chemical approach to the problem of the solid-state growth of chemical compound layers and reaction-diffusion in binary heterogeneous systems formed by two solids; as well as a solid with a liquid or a gas. It is explained why the number of compound layers growing at the interface between the original phases is usually much lower than the number of chemical compounds in the phase diagram of a given binary system. For example, of the eight intermetallic compounds which exist in the aluminium-zirconium binary system, only ZrAl3 was found to grow as a separate