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The Thermodynamic Database for the Development of Modern Lead-Free Solders; Thermodynamic Properties of Liquid Binary Transition-Metal Alloys in the Bretonnet-Silbert Model; Steam Oxidation Behaviour of Ni-Based Single Crystalline Superalloy for the Advanced Gas Turbine; The Effect of Oxide Cracks on Hydrogen Ingress in ZrO₂; Kinetic and Thermodynamic Aspects of High-Temperature Oxidation of Selected Ti-Based Alloys; The BFS Method Combined with Chemical Cluster Interactions for the Study of Order-Disorder Transitions; Thermodynamic Aspects of Diffusion Paths in Ternary Systems; The Influence of Thermodynamic Properties of Alloys on Effective Interdiffusion Coefficients in Ternary Systems; Iron-Based Nanocomposite Synthesised by Microwave Plasma Decomposition of Iron Pentacarbonyl; Diffusion of Carbon and Manganese in Fe-C-Mn; Tracer Diffusion of Molybdenum in Crystallized Fe_{79-y}Mo₈Cu₁B_{12+y} Alloy; Zn Diffusion in Binary Base of Light Mg-Al Alloys; Simulation of Precipitates Evolution in Steels; Surface Diffusion and Island Growth; Diffusional Growth Kinetics of Boride Layers at the 13% Cr Steel Interface with Amorphous Boron; Diffusion of Zinc in Two-Phase Mg-Al Alloy; Microstructural Stability of Dissimilar Weld Joint of Creep-Resistant Steels with Increased Nitrogen Content at 500 - 900 °C; Diffusion in the Presence of Twin Boundaries; Grain Boundary Self-Diffusion in Nickel; Study of Kirkendall Effect in Ni/Ni₃Al Welded Joint after the High Temperature Annealing; Diffusion in Transition Metal Diborides - An Overview; Carbon and Nitrogen Activities of Materials of Weld Joints; Study of Reaction Diffusivity in the Copper-Indium-Tin Ternary System; Analysis of the Rate of Oxidation of the Arema Steel at High-Temperature; Keywords Index; Authors Index

Sommario/riassunto

The diffusion of atoms is an inherent feature of matter, and the rules which describe the phenomenon are important from both the purely practical and the theoretical perspectives: it is a major rate-controlling process in phase transformations, crystal growth, recrystallization and recovery, creep, sintering, surface treatment and many other situations. Being typically a non-equilibrium macroscopic phenomenon, diffusion can be properly described in terms of the thermodynamics of irreversible processes. At the same time, phenomenological diffusion characteristics represent the mean values of m_i
