

# Table of Contents

|                                                                                                                                                                                                                                                    |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Interdiffusion Data in Multicomponent Alloys as a Source of Quantitative Fundamental Diffusion Information</b><br>I.V. Belova and G.E. Murch                                                                                                    | 1   |
| <b>Diffusion and Phase Transformations in Multi-Component Systems</b><br>G. Inden                                                                                                                                                                  | 11  |
| <b>From Phase Equilibria to Transformation Dynamics</b><br>T. Mohri, M. Ohno and Y. Chen                                                                                                                                                           | 21  |
| <b>Metastable Phase Formation in Multi-Component Aluminium Alloys</b><br>A.P. Miodownik, N. Saunders, J.P. Schille and Z.L. Guo                                                                                                                    | 31  |
| <b>Atomic Migration in Bulk and Thin Film L1<sub>0</sub> Alloys: Experiments and Molecular Dynamics Simulations</b><br>V. Pierron-Bohnes, R.V.P. Montsouka, C. Goyhenex, T. Mehaddene, L. Messad, H. Bouzar, H. Numakura, K. Tanaka and B. Hennion | 41  |
| <b>Self-Diffusion in Covalent Amorphous Solids – A Comparative Study Using Neutron Reflectometry and SIMS</b><br>H. Schmidt, M. Gupta, U. Geckle and M. Bruns                                                                                      | 51  |
| <b>Spatially Periodic Formation of Nanoparticles in Metal-Doped Glasses</b><br>Y.S. Kaganovsky, A.A. Lipovskii, M. Rosenbluh and V. Zhurikhina                                                                                                     | 57  |
| <b>Atomic Motion and Diffusion Mechanism of Hydrogen in Amorphous Ceramics of the System Si-B-C-N</b><br>W. Gruber, G. Borchardt and H. Schmidt                                                                                                    | 63  |
| <b>NGR Investigation of Grain-Boundary Diffusion in Poly- and Nanocrystalline Nb</b><br>V.V. Popov, V.N. Kaigorodov, E.N. Popova and A.V. Stolbovsky                                                                                               | 69  |
| <b>Interfacial Interaction and Diffusion in Binary Systems</b><br>V.I. Dybkov                                                                                                                                                                      | 75  |
| <b>Collective and Tracer Diffusion via a Defect Cluster in LSGM</b><br>I.V. Belova, G.E. Murch, D. Samuelis and M. Martin                                                                                                                          | 81  |
| <b>Mechanism and Kinetics of Plasma Nitriding of the Nb-Alloyed PM Tool Steel</b><br>P. Novák, D. Vojtech, J. Šerák, M. Novák and B. Bártová                                                                                                       | 87  |
| <b>Effect of Fe Addition on Ordering Kinetics in Ni<sub>3</sub>Al<sub>1-x</sub>Fe<sub>x</sub> System. Monte Carlo Simulation</b><br>E. Partyka and R. Abdank-Kozubski                                                                              | 93  |
| <b>The Thermodynamic Database for the Development of Modern Lead-Free Solders</b><br>A. Kroupa and J. Vízdal                                                                                                                                       | 99  |
| <b>Thermodynamic Properties of Liquid Binary Transition-Metal Alloys in the Bretonnet-Silbert Model</b><br>N.E. Dubinin, L.D. Son and N.A. Vatolin                                                                                                 | 105 |
| <b>Steam Oxidation Behaviour of Ni-Based Single Crystalline Superalloy for the Advanced Gas Turbine</b><br>H. Fujikawa, T. Murakumo, S. Newcomb and H. Harada                                                                                      | 111 |
| <b>The Effect of Oxide Cracks on Hydrogen Ingress in ZrO<sub>2</sub></b><br>H.L. Li, Q. Wen and J.A. Szpunar                                                                                                                                       | 117 |
| <b>Kinetic and Thermodynamic Aspects of High-Temperature Oxidation of Selected Ti-Based Alloys</b><br>D. Vojtech, M. Mort'ániková and P. Novák                                                                                                     | 123 |
| <b>The BFS Method Combined with Chemical Cluster Interactions for the Study of Order-Disorder Transitions</b><br>M. Schurmans, J. Luyten and C. Creemers                                                                                           | 129 |
| <b>Thermodynamic Aspects of Diffusion Paths in Ternary Systems</b><br>T. Laas, Ü. Ugaste and J. Priimets                                                                                                                                           | 135 |
| <b>The Influence of Thermodynamic Properties of Alloys on Effective Interdiffusion Coefficients in Ternary Systems</b><br>Ü. Ugaste, T. Laas and T. Škled-Gorbatšova                                                                               | 141 |
| <b>Iron-Based Nanocomposite Synthesised by Microwave Plasma Decomposition of Iron Pentacarbonyl</b><br>B. David, N. Pizúrová, O. Schneeweiss, T. Hoder, V. Kudrle and J. Janča                                                                     | 147 |

|                                                                                                                                                                                      |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Diffusion of Carbon and Manganese in Fe-C-Mn</b><br>L. Král, B. Million and J. Čermák                                                                                             | 153 |
| <b>Tracer Diffusion of Molybdenum in Crystallized Fe<sub>79-y</sub>Mo<sub>8</sub>Cu<sub>1</sub>B<sub>12+y</sub> Alloy</b><br>J. Čermák and I. Stloukal                               | 159 |
| <b>Zn Diffusion in Binary Base of Light Mg-Al Alloys</b><br>J. Čermák and I. Stloukal                                                                                                | 165 |
| <b>Simulation of Precipitates Evolution in Steels</b><br>V.V. Popov and I. Gorbachev                                                                                                 | 171 |
| <b>Surface Diffusion and Island Growth</b><br>R. Reitingner, B. Pfau, L.M. Stadler, S. Stankov, M. Zajac, N. Spiridis, B. Sepiol, F. Zontone and J. Korecki                          | 177 |
| <b>Diffusional Growth Kinetics of Boride Layers at the 13% Cr Steel Interface with Amorphous Boron</b><br>V.I. Dybkov                                                                | 183 |
| <b>Diffusion of Zinc in Two-Phase Mg-Al Alloy</b><br>I. Stloukal and J. Čermák                                                                                                       | 189 |
| <b>Microstructural Stability of Dissimilar Weld Joint of Creep-Resistant Steels with Increased Nitrogen Content at 500 – 900 °C</b><br>B. Zlámál, R. Foret, J. Buršík and M. Svoboda | 195 |
| <b>Diffusion in the Presence of Twin Boundaries</b><br>V. Rothová                                                                                                                    | 201 |
| <b>Grain Boundary Self-Diffusion in Nickel</b><br>V. Rothová, J. Buršík, M. Svoboda and J. Čermák                                                                                    | 207 |
| <b>Study of Kirkendall Effect in Ni/Ni<sub>3</sub>Al Welded Joint after the High Temperature Annealing</b><br>M. Losertová, K. Čech Barabaszová, J. Drápala and M. Kursá             | 213 |
| <b>Diffusion in Transition Metal Diborides - An Overview</b><br>H. Schmidt, G. Borchardt, S. Weber and H. Scherrer                                                                   | 219 |
| <b>Carbon and Nitrogen Activities of Materials of Weld Joints</b><br>Z. Hodis and J. Sopoušek                                                                                        | 225 |
| <b>Study of Reaction Diffusivity in the Copper–Indium–Tin Ternary System</b><br>J. Drápala, P. Kubíček, J. Vřešťál and M. Losertová                                                  | 231 |
| <b>Analysis of the Rate of Oxidation of the Arema Steel at High-Temperature</b><br>K. Adamaszek and Z. Jurasz                                                                        | 237 |