

Table of Contents

Preface

I. Advanced Mechanical Properties of Nanostructured Materials

On the Conflicts in the Experimental Results Concerning the Mechanical Properties of Ultra-Fine Grained and Nanostructured Materials: Effects of Processing Routes and Experimental Conditions K.A. Padmanabhan and S.B. Prabu	3
On the Cyclic Deformation Response and Microstructural Mechanisms of ECAPed and ARBed Copper - an Overview C.C.F. Kwan and Z.R. Wang	55
The Effect of Grain Boundary State on Deformation Process Development in Nanostructured Metals Produced by the Methods of Severe Plastic Deformation E.V. Naydenkin, G.P. Grabovetskaya and K.V. Ivanov	69
Improvement of Fracture Toughness (K_{Ic}) of 7075 Al Alloy by Cryorolling Process P. Das, R. Jayaganthan, T. Chowdhury and I. Singh	81
The Influence of Stacking Fault Energy on the Cold-Rolling Cu and Cu-Al Alloy: Structure and Mechanics Properties H. Yang, P. Yang, J.M. Tao, C.J. Li and X.K. Zhu	95
Influence of Annealing on the Microstructure and Mechanical Properties of Electrodeposited Nanocrystalline Nickel B. Yang	103
Mechanical Behaviors of Electrodeposited Bulk Nanocrystalline Metals and Alloys S. Han, J.S. Lian, J.W. Mu, X.X. Shen, L.Y. Qin, Z.H. Jiang and Q. Jiang	113
Microstructure and Microhardness of a Nanostructured Nickel-Iron Based Alloy S.K. Mukhtarov and X. Sauvage	127
Mechanical and Functional Properties of Titanium Alloys Processed by Severe Plastic Deformation V.V. Stolyarov	137
Mechanical Properties and Fracture Behaviour of Nanostructured and Ultrafine Structured TiAl Alloys Synthesised by Mechanical Milling of Powders and Hot Isostatic Pressing D.L. Zhang, H.B. Yu and Y. Chen	149

II. Deformation Mechanics of Bulk Nanostructured Materials

Structure Evolution and Deformation Resistance in Production and Application of Ultrafine-Grained Materials – the Concept of Steady-State Grains W. Blum and P. Eisenlohr	163
Stages of Plastic Deformation in Metallic Nanocrystals N. Koneva and E. Kozlov	183
Tensile Deformation Behaviors of Ultra-Fine Subgrained Aluminum X.J. Xu, C. Cheng, Y. Luo, T. Song and Z.D. Fei	189
Deformation Mechanisms in Nanocrystalline Nickel at Low Temperatures L. Hollang, K. Reuther, S.R. Dey, E. Hieckmann and W. Skrotzki	193
Kinetic Modeling of the Deformation Behavior of High-Strength Nanostructured Al-Mg Alloys I.V. Alexandrov, R.G. Chembarisova and M.I. Latypov	203
Vortices and Mixing in Metals during Severe Plastic Deformation Y. Beygelzimer	213
Process Design Concepts for the Production of Ultrafine Grained Steels through Multi-Pass Warm Rolling: Bridging Science and Technology S.V.S. Narayana Murty and S. Torizuka	225
Grain Refinement in Commercial Purity Titanium Sheets by Constrained Groove Pressing G.V.P. Kumar, G.G. Niranjana and C. Uday	233

Achievable Strength of Nanostructured Composites with Co-Deformable Components K. Han and J.P. Chen	243
Thermal Stability of Fine Grains as a Function of Process Parameters in FSW Butt Joints E. Cerri	249