

Table of Contents

Introduction

Mechanical Spectroscopy and Relaxation Phenomena in Solids

L.B. Magalas and B.M. Darinskii 1

Determination of the Logarithmic Decrement in Mechanical Spectroscopy

L.B. Magalas 7

Mechanical Spectroscopy, Internal Friction and Relaxation Phenomena in Solids – Suggested Reading

L.B. Magalas, S.A. Golovin and B.M. Darinskii 15

Metals, Alloys and Quasicrystals

Mechanical Spectroscopy of Quasicrystals

H.R. Sinning 25

The Snoek Effect in Ternary BCC Alloys. A Review

M. Koiwa and H. Numakura 37

Hydrogen Interaction with Dissolved Atoms and Relaxation Properties of Metal Solid Solutions

M.S. Blanter and L.B. Magalas 41

Diffusion of Hydrogen in the Ni₃₀Ti₅₀Cu₂₀ Shape Memory Alloy

G. Mazzolai, A. Biscarini, B. Coluzzi, F.M. Mazzolai and U. Straube 51

Specific Properties of Industrial High-Damping Fe-Al Steels

V.A. Udoenko and I.B. Chudakov 57

Ultrasonic Investigation of the Ni₄₀Ti₅₀Cu₁₀ Alloy

U. Straube, G. Mazzolai, A. Biscarini, B. Coluzzi, F.M. Mazzolai and H. Beige 63

The Snoek-Köster (SK) Relaxation and Dislocation-Enhanced Snoek Effect (DESE) in Deformed Iron

L.B. Magalas 67

Atomic Structure of the Intercrystalline General Type Boundaries. Mechanisms of the Grain Boundary Peak of Internal Friction. Premelting

B.M. Darinskii, Y. Kalinin and D.S. Sajko 73

High-Temperature Mechanical Relaxations in Metals and Metallic Alloys

A. Rivière 87

Glasses, Polymers and Carbon Nanotubes

Physical Aging of Amorphous Matter: Down to the Nanometric Scale

S. Etienne, L. David, E. Duval, A. Mermet, A. Wypych and G. Simeoni 99

An Acoustic Study of Irreversible Structural Relaxation in a Bulk Metallic Glass

N.P. Kobelev, E.L. Kolyvanov and V.A. Khonik 113

Isothermal Stress Relaxation of Bulk and Ribbon Pd₄₀Cu₃₀Ni₁₀P₂₀ Metallic Glass

O.P. Bobrov, S.N. Laptev and V.A. Khonik 121

Nonlinear Elastic Properties of Bulk Metallic Glasses Zr_{52.5}Ti₅Cu_{17.9}Ni_{14.6}Al₁₀ and Pd₄₀Cu₃₀Ni₁₀P₂₀

N.P. Kobelev, E.L. Kolyvanov and V.A. Khonik 127

Structural Relaxation Processes in Fe₄₀Ni₄₀P₁₄B₆ Glass under Continuous Heating

V.I. Tkatch, S.G. Rassolov, V.I. Krysov, V.V. Popov and V.Y. Kameneva 133

Comparing Irreversible and Reversible Structural Relaxation in Bulk and Ribbon Metallic Glasses Zr_{52.5}Ti₅Cu_{17.9}Ni_{14.6}Al₁₀ and Pd₄₀Cu₃₀Ni₁₀P₂₀ by Mechanical Spectroscopy

M. Eggers, V.A. Khonik and H. Neuhäuser 139

Relaxations and Thermomechanical Stability of a Crosslinked Photopolymer

Z. Ayadi, S. Etienne, M. Nivoit, J.M. Fiorani and C. Cunat 145

Mechanical Relaxations and Transitions in Poly(Vinylidene Fluoride) PVDF

A. Gasmi, M. Gouasmia and S. Etienne 151

Mechanical Spectroscopy of Oil Films Deposited on Metallic Substrate	157
L.B. Magalas and S. Etienne	
Hydrogen Relaxation Process in HiPco Carbon Nanotubes Studied by Mechanical Spectroscopy	163
R. Cantelli, A. Paolone, S. Roth and U. Dettlaff	
 Magnetic, Dielectric, Mechanical and Light Induced Relaxation Phenomena	
Magnetoplastic Effect: From Spin Dynamics to Dislocation Mobility	169
R.B. Morgunov, A. Baskakov, I. Blokhin, L. Dunin-Barkovskii, S. Shmurak and Y. Tanimoto	
Discontinuity of Plastic Flow Controlled by Magnetic Field in NaCl:Eu Crystals	183
L. Dunin-Barkovskii, R.B. Morgunov and Y. Tanimoto	
Relaxation Effects in La₂Mo₂O₉-Based Oxide-Ion Conductors	193
Q.F. Fang, X.P. Wang, Z.G. Yi and Z.J. Cheng	
Giant Dielectric Relaxation in Ordered Matrix Systems Depicted by Maxwell-Garnett Formula	203
A.V. Turik, G.S. Radchenko, A.I. Chernobabov and S.A. Turik	
Giant Piezoelectric and Dielectric Relaxations in Statistical Mixtures	209
A.I. Chernobabov, A.V. Turik, G.S. Radchenko and S.A. Turik	
Elastic Constants Relaxation in Disordered Heterogeneous Systems	215
A.V. Turik, L.A. Reznitchenko, A.I. Chernobabov, G.S. Radchenko, S.A. Turik and M.G. Radchenko	
Structure and Conductivity of Nanostructured Sodium Nitrite	221
I. Golosovsky, V. Dvornikov, T. Hansen, A. Fokin, E. Koroleva, L. Korotkov, A. Naberezhnov and M. Tovar	
Low and Infra-Low Frequency Measurements in Lead Titanate Solid Solutions	229
K. Bormanis, S.A. Satarov, A. Kalvane, A.I. Burkhanov, A.V. Shil'nikov and M. Dambekalne	
Dispersion of Dielectric Permittivity in Thin Ferroelectric Lead Titanate Films	233
S. Sidorkin, L.P. Nesterenko, I.A. Bocharova, G.L. Smirnov, V.A. Sidorkin, S.V. Ryabtsev and A.L. Smirnov	
Influence of the External Field on the Polarization in the Surface Layer of Strontium Barium Niobate Crystals	239
O.V. Malyshkina, A.A. Movchikova, B.B. Ped'ko and T.O. Zaznabin	
Light-Induced Structural Relaxation and the Photoplastic Effect in Chalcogenide Glasses	245
M.L. Trunov, S.N. Dub and R.S. Shmegeira	
The Influence of Mechanical Deformation on the Optical Properties of Laminated As₂S₃, GeSe₂ and As₂Se₃ Crystals	251
A.B. Babaev, I.K. Kamilov, S.B. Sultanov, F.S. Gabibov and A.M. Askhabov	
 Other Relaxation Phenomena	
Memory Effects in Quantum Theory of Relaxation	255
V.G. Morozov and G. Roepke	
Relaxation of Highly Non Equilibrium Charge Carriers in Crystals by Low-Energy Electron Influence	261
O.F. Panchenko and L.K. Panchenko	
The Self-Organisation of Tetrahedrally Close-Packed Structures in Magnetic Nanocrystalline Tb-Fe and Co-Pd Films	267
L.I. Kveglis, A.V. Kuzovnikov and I.V. Timofeev	
Inelastic Relaxation in Tin Dioxide Thin Films	275
V.I. Mitrokhin, S.I. Rembeza, E.S. Rembeza and A.A. Rudenko	
Specific Features of Brillouin Spectra at a High-Temperature Phase Transition in Cs₅H₃(SO₄)₄xH₂O Crystals	279
A.I. Fedoseev, S.G. Lushnikov, J.H. Ko, S. Kojima and L.A. Shuvalov	
 Experimental Techniques and Computer Modeling	
Zero-Point Drift in Low-Frequency Mechanical Spectroscopy	285
L.B. Magalas and A. Piłat	

Extrinsic Resonance Effects in a Subresonant Mechanical Spectrometer	
L.B. Magalas	293
On-Line Control of Harmonic Oscillations in a Low-Frequency Resonant Mechanical Spectrometer	
L.B. Magalas and A. Piłat	299
The Nonempirical Calculation of the Cation Ordering and Lattice Dynamics in the Solid Solutions of $\text{PbSc}_{1/2}\text{Nb}_{1/2}\text{O}_3$ and $\text{PbSc}_{1/2}\text{Ta}_{1/2}\text{O}_3$	
V.I. Zinenko and S.N. Sofronova	305
Simulation of the Oriented Crystallisation of Cu/Pd(001) Amorphous Film	
A.A. Dmitriev, A.V. Evteev, V.M. Ievlev, A.T. Kosilov and E.V. Levchenko	311
3D Lattice Model for the Phase Transition in a Water/Oil/Surfactant/Cosurfactant Mixture	
L.V. Elnikova	315