

Table of Contents

Preface

Application of Electron Spin Resonance in Biophysics: from Rapid Mixing Stopped-Flow to High-Hydrostatic Pressure ESR

A. Sienkiewicz, M. Jaworski, S. Garaj, L. Forró and C.P. Scholes 1

Intermolecular Interactions of Proteins under Pressure. Aggregation, Dissociation, Chaperoning

L. Smeller, F. Meersman, J. Fidy and K. Heremans 19

Potentialities in High Pressure Bioscience

J. Torrent and C. Balny 25

Pressure Effects on the Structure and Phase Behaviour of Phospholipid-Gramicidin Bilayers

J. Eisenblätter and R. Winter 35

Pressure-Temperature Effects on Proteins: Unfolding, Aggregation and Fibrillogenesis

F. Meersman, H. Pfeiffer, L. Smeller and K. Heremans 47

Pharmaceuticals Perspectives of High Pressure: A Soft Tool for Sterilization of Fragile Drugs

Y. Rigaldie, G. Lemagnen, A. Largeau, D. Larrouture, M. Abba, R. Haller, L. Grislain and G. Demazeau 55

Change of Activity of Blood Serum Transferases after High Hydrostatic Pressure Treatment

L. Donchenko, N. Shishkova and V. Barbashov 59

Effect of High Hydrostatic Pressure on the Ability of Neutrophils to Phagocytosis

N. Shishkova, L. Donchenko and V. Barbashov 63

Inactivation of Bacteria at High Pressure

P. Grzesiowski, I. Łętowska, S. Porowski, P. Sałański, J. Jurczak, M. Giel-Pietraszuk, W. Hryniewicz and J. Barciszewski 67

Influence of UHP Treatment on Quality of Ham

K. Karłowski, B. Windyga, M. Fonberg-Broczek, H. Ścieżyńska, A. Grochowska, K. Górecka, J. Mroczek, D. Grochalska, A. Barabasz, J. Arabas, J. Szczepak and S. Porowski 73

The Apple Juices Preserved by High Pressure Treatment at Moderate Temperature and Pasteurisation. Comparative Quality Assessment

E. Kostrzewska, M. Fonberg-Broczek, A. Jakubowski, S. Skapska, B. Sieliwanowicz, A. Witkowska-Gwiazdowska, D. Zdziennicka, J. Arabas and J. Szczepak 77

How High Pressures can be Involved in Chemical Bonding

G. Demazeau 85

Pressure Effects in Organic Chemistry

J. Jurczak and D.T. Gryko 95

Thermodynamics of the Metal-Hydrogen Systems in DAC

M. Tkacz 107

High Pressure EPR Studies of Nickel Complexes

A. Krupska and M. Krupski 117

Polymerization at High Pressure of Dimethyl Acetylene: Raman Microscopy, Vibrational Analysis, Calculation of Force Constants and Internal Coordinates

F.J. Pérez Tejedor, O.R. Montoro, O. Rodríguez-Jiménez, V.G. Baonza and J. Núñez Delgado 121

Pressure as a Tool to Investigate Vibrational Fermi Resonance in Molecular Liquids: Study of Liquid Methanol up to 20 kbar by Raman Microscopy

A. Arencibia, V.G. Baonza, F.J. Pérez Tejedor and M. Taravillo 125

Pressure-Induced Transformations of Low-Energy Excitations in a Polymer Glass Studied by Spectral Hole Burning

A. Laisaar, V. Hizhnyakov, J. Kikas, A. Kuznetsov and A. Suisalu 129

Pressure Solvation of Photosynthetic Pigments

A. Ellerjee and A. Freiberg 135

Bulk Nanostructured Materials Produced by Severe Plastic Deformation under High Pressure

R. Valiev and I.V. Alexandrov 141

Intermetallic Growth under High Hydrostatic Pressures	151
L.N. Paritskaya, Y.S. Kaganovsky, V.V. Bogdanov and W. Łojkowski	
Novel Carbon Materials: Possibility of Shock-Wave Synthesis	161
V.V. Milyavskiy, A.Z. Zhuk and K.V. Khishchenko	
Phase Transformation in Nanocrystals under Pressure	175
J.Z. Jiang	
X-Ray Characterization of Nanostructured Materials	187
R. Pielaśek, S. Gierlotka, S. Stelmakh, E. Grzanka and B.F. Palosz	
Influence of High Pressure on the Polytipe Structure of Nanocrystalline GaN	201
R. Pielaśek, S. Gierlotka, S. Stelmakh, E. Grzanka and B.F. Palosz	
On the Relation between Interface Energy and Free Volume	209
W. Łojkowski, A. Otsuki and A. Morawski	
Computer Study of the Severe Shear Deformations of Solids under High Pressure	213
A. Spuskanyuk, Y. Beygelzimer and V. Varyukhin	
High Pressure Dependence of the Discontinuous Ordering (DO) Reaction in the Fe – 50% at. Co Alloy	217
V. Semenov, D. Kolesnikov, M. Zenotchkin, J. Jun, W. Łojkowski, E. Rabkin and W. Gust	
Influence of Long-Ordering Parameter and Boron Microalloying on Mechanical Properties of Nanocrystalline Intermetallic Compound Ni₃Al	223
A.V. Korznikov, S.R. Idrisova, Z. Pakiela and K.J. Kurzydlowski	
Nanostructure Formation in Copper Subjected to High Pressure Torsion	229
I.V. Alexandrov, A. Dubravina and H.S. Kim	
Pressure Influence on Solid Phase Transformation in Metals and Alloys after Severe Plastic Deformation	233
B. Efros, V.P. Pilyugin, A.M. Patselov and S.V. Gladkovskii	
Formation of Submicrocrystalline Structure in Titanium and its Alloy under Severe Plastic Deformation	237
S.V. Zherebtsov, G.A. Salishchev and R.M. Galeev	
A First-Order Phase Transformation between Amorphous Phases in a Zn-Sb Alloy under High Pressures	241
A.I. Harkunov, V.E. Antonov, O.I. Barkalov, M. Calvo-Dahlborg, U. Dahlborg, V.K. Fedotov, E.G. Ponyatovsky and M. Winzenick	
Low Dimensionality Magnetism in New Layered Oxides: the Phyllosiloxides	251
K.P. Hong, G. Goglio, G. Demazeau and D.-. Jung	
High Pressure Treatment of Semiconductor-Metal Heterophase Structures	255
S. Ovsyannikov, V.V. Shchennikov, A.Y. Derevskov and V.V. Osotov	
Nanostructured Metals Transformation Study by Means of Electroactive Polymer	261
A.N. Lachinov, T.G. Zagurenko, V.M. Kornilov, I.V. Alexandrov and R. Valiev	
Comparative Studies of Conductivity of Graphite and Fullerene at High Pressure	267
G. Tikhomirova and A.N. Babushkin	
Conductivity of Ammonium Halides NH₄Cl and NH₄F at Pressures up to 50 Gpa	271
G. Tikhomirova and A.N. Babushkin	
Magnetoresistance and Thermoelectric Power of Semiconductors at Pressures up to 30 GPa	275
V.V. Shchennikov	
High-Pressure NMR Spectroscopy: Some General Aspects and Applications	283
J.W. Sprengers, A.M. Kluwer, S. Gaemers and C.J. Elsevier	
Application of the AC Impedance Spectroscopy at High Pressures: Electrophysical Properties of Sulfur	295
Y.A. Kandrina, A.N. Babushkin, S.N. Shkerin and Y. Volkova	
A Standard Diamond-Anvil Cell Adapted for Work on Biological Molecules and Soft Solids	299
N.W.A. van Uden and D.J. Dunstan	
Electrical Characteristics of NaCl at Frequencies of 1-100 kHz at Superhigh Pressures. Application of an Impedance Spectroscopy	303
Y. Volkova and A.N. Babushkin	
Influence of High Hydrostatic Pressure up to 2.5 GPa on the Resistance of Lanthanum-Manganese Samples	307
P.I. Polyakov, V.P. Pashchenko and S.S. Kucherenko	

Metal Plasticity during the Twist Extrusion	
Y. Beygelzimer and D. Orlov	311
Solid State Transitions Investigations in DAC by Spectroscopy Methods	
A.M. Prudnikov, A. Misiuk, B. Efros, I.E. Tyschenko, L.V. Loladze and N. Shishkova	315
Structural Refinements on Restricted Intensity Data Collected in High-Pressure Diffraction Experiments	
K. Dziubek and A. Katrusiak	319