

# Contents

3-D Atomic-scale Analysis of Thin Film Materials: Progress and Future Prospects <i>T. Berghaus, Omicron Vakuumphysik GmbH, Taunusstein (D); D.J. Larson, Seagate Technology, Bloomington, MN (USA); A. Cerezo, M. Huang, A.K. Petford-Long, G. Schäfer, G.D.W. Smith, University of Oxford (UK)</i> .....	1
Investigation of Fractal Properties of the Microstructure of Porous Metal Materials <i>A. V. Egorov, S. V. Kucheryavski, V. V. Polyakov, Altai State University, Barnaul (RUS)</i> .....	7
State of Art Micro-CT <i>E. Buelens, A. Sassov, SkyScan, Aartselaar (B)</i> .....	11
Positron Annihilation Studies of Early Stages of Precipitation in High-Strength 2024 Al-Cu-Mg Alloy <i>S. Depetasse, N. Meyendorf, A. Sourkov, Fraunhofer IZFP, Saarbrücken (D); G. Dlubek, ITA Institut Köthen/Halle (D)</i> .....	17
Positron Annihilation Spectroscopy - The Tool for the Characterization of Defects in Porous and Fine-Grained Powder Compacts <i>T.E.M. Staab, Helsinki University of Technology (FIN); B. Kieback, Technical University Dresden (D)</i> .....	23
Investigation of Site Occupation in Non-Stoichiometric Ni-Zr Substituted Barium Hexaferrites <i>M. V. Rane, Forschungszentrum Jülich GmbH (D); D. Bahadur, C. M. Srivastava, Indian Institute of Technology, Bombay (IND); A. K. Nigam, Tata Institute of Fundamental Research, Mumbai (IND)</i> .....	29
Novel Light Scattering Technique by Visible Laser (632.8nm) for Microstructural Investigation of the Two Dimensional Periodic Array <i>M. Curley, K. X. He, I. Jones III, J. C. Wang, Department of Physics, Alabama A &amp; M University, Normal, AL (USA); A. Chow, George C. Marshall Space Flight Center, AL (USA); C. Holden, Langley Research Center, Hampton, VA (USA); J. Mo, Memphis State University, TN (USA)</i> .....	34
Structural Analysis of Ceramic Suspensions by CRYO-SEM Investigations <i>M. J. Hoffmann, R. Oberacker, H. von Both, University of Karlsruhe (D)</i> .....	41
Aperiodic Crystal Structure and Conductivity of Dental Enamels and Special Porcelain Enamel <i>N. Van Tri, Hanoi University of Technology, Hanoi-Vietnam (IND)</i> .....	47
Anodization Spectroscopy Express-control System for Thin-Film Technologies <i>T. Lebedeva, P. Shpilevoy, I. Voytovytsch, Ukrainian Academy of Sciences, Kyiv (UA)</i> .....	53

Calorimetric Measurement of the Stored Energy in Iron <i>F. Scholz, E. Woldt, Institut für Werkstoffe, Braunschweig (D);</i> <i>J. Driver, Microstructures and Processing Department, Saint-Étienne (F).....</i>	59
EELS in Materials Science: Possibility Beyond Microanalysis <i>V. Schlosser, Institut f. Materialphysik, Universität Wien (A);</i> <i>C. Hébert, M. Nelhiebel, P. Schattschneider, St. Weichselbaum, Technische</i> <i>Universität Wien (A) .....</i>	65
Thin Film and Interface Analysis of Microprocessor Device Structures – Requirements and Practical Examples <i>W. Blum, H.-J. Engelmann, C. Weiss, E. Zschech, AMD Saxony Manufacturing GmbH</i> <i>Dresden (D) .....</i>	71
Chemical Analysis of Polymer Surfaces on a Molecular Scale <i>J. Behnisch, A. Holländer, Fraunhofer-Institut für Angewandte Polymerforschung, Teltow (D)</i>	76
Microstructure Investigation on Al-Ni and Al-Fe Eutectics in MMC by SEM and TEM Microanalysis <i>P. C. Olaru, FAUR S.A. Bucharest (RO) .....</i>	82
Local Probe Scanning Auger-Electron Microscopy Studies of Segregation Effects upon In- Situ Fracture <i>J.Th.M. De Hosson, G. Palasantzas, D.T.L. van Agterveld, University of Groningen (NL)....</i>	87
Real Structure Study by Diffraction <i>J. Fiala, SKODA Research Ltd, Plzen (CZ).....</i>	93
Microstructure, Texture and Residual Stresses of Hot-Extruded AlSi-Alloys <i>K.-D. Liss, ESRF Grenoble (F);</i> <i>A. Pyzalla, J. Wegener, Hahn-Meitner-Institut, Berlin (D);</i> <i>K.B. Müller, TU-Berlin (D).....</i>	96
Local Strain Analysis with LACBED and Weak-Beam Imaging <i>H. Heinrich, G. Kostorz, A. Vananti, ETH Zürich, Institute of Applied Physics, (CH).....</i>	103
Local Texture Characterisation using TEM <i>E. Bouzy, J.J. Fundenberger, University of Metz (F) .....</i>	108
Characterization of the Deformation Field Near the Crack Tip after Bending by Small Angle X-ray Scattering <i>J. Boehmert, Forschungszentrum Rossendorf, Dresden (D);</i> <i>M. Grosse, Paul-Scherrer-Institut, Villigen (CH) .....</i>	114
Studies on the Magnetic Fluids to Determine Micro-Fields in Silicon Plates used for Transformers <i>D. Dima, A. Doniga, E. Vasilescu, Dunarea de Jos University of Galati (RO);</i> <i>C. Stanciu, KPPAM, Galati (RO);</i> <i>T. Dumitrescu, University of Târgoviste (BG).....</i>	121

Metallurgical Aspects Occurring in Thin Bimetal Samples Welded by Explosion <i>D. A. Goga, Technical Military Academy of Bucharest (RO); R. Stoenescu, I. Tonoiu, University Politehnica of Bucharest (RO)</i> .....	128
Transformation Kinetics of a Low Silicon Austempered Ductile Iron <i>R. E. Smallman, University of Birmingham, Edgbaston (UK); M. Grech, J. M. Mallia, University of Malta, Msida (M)</i> .....	134
Microstructured of Annealed Ti <sub>50</sub> Ni <sub>25</sub> Cu <sub>25</sub> Melt-spun Ribbons <i>H. Rösner, P. Schloßmacher, Forschungszentrum Karlsruhe GmbH (D); A.M. Glezer, A.V. Shelyakov, Moscow Engineering Physics Institute (RUS)</i> .....	140
High Temperature Degradation Mechanism of an Ni-Cr-Co Alloy Used During the Binary Copper Aluminium Foundary <i>N. Battistelli, BRONZE ACIOR SA, La Couture Boussey (F); E. Beucher, CRITT Analyses &amp; Surface, Louviers (F)</i> .....	146
The Characterization of Crystal Plasticity by Orientation Image Microscopy and Local Deformation Measurements <i>O. Kolednik, Ch. Motz, R. Pippan, A. Tatschl, Austrian Academy of Sciences, Leoben (A)</i> ..	151
Microstructural Investigations and Residual Stress Analysis of ZrO <sub>2</sub> /Ni Functionally Graded Materials <i>D. Dantz, Ch. Genzel, W. Reimers, Hahn-Meitner-Institut Berlin (D)</i> .....	157
Advances in High Resolution Elemental Analysis using Image-Spectroscopy <i>P. A. Midgley, P. J. Thomas, M. Weyland, University of Cambridge (UK)</i> .....	163
Effect of Complex Strain Paths on Hot Deformation of Aluminium Alloys <i>S. van der Zwaag, Delft Univeristy of Technology (NL); B. Davenport, Netherlands Institute for Metals Research, Delft (NL)</i> .....	169
The Technique to Visualize Hydrogen in Metals <i>K. Ichitani, M. Kanno, S. Kuramoto, A. Nagao, The University of Tokyo (J)</i> .....	175
Crack Pattern and Damage Mode in Alumina Trilayer Structures <i>S.-Ch. Choi, E.-S. Han, Ch.-Y. Lee, Hanyang Women's College, Seoul (DVRK)</i> .....	180
Texture Analysis in Quantitative Microstructure Analysis <i>T. Bernthaler, U. Klauack, J. Schmid, G. Schneider, B. Stahl, J. Theuer, H. Zhao, University of Applied Science Fachhochschule Aalen (D)</i> .....	186
A New Method for the Determination of Hydrodynamic Particle Dimension in Magnetic Fluids <i>C. Dan Buioca, V. Iusan, University of Petrosani (RO); C. Cotae, University "Gh. Asachi" Iassy (RO)</i> .....	191

Elaboration of Titanium Carbonitride-Nickel and Titanium Carbonitride-TA6V Bonds, Modelling of the Thermomechanical Behaviour <i>F. Hugot, ENSIL, Limoges (F); M. Desmason, SPCTS, Université de Limoges (F)</i> .....	197
Influence of Mechanical Deep Drilling on the Near-Surface-Microstructure of Ti6Al4V <i>U. Glatzel, L. Reißig, Friedrich-Schiller-Universität Jena (D)</i> .....	202
Grain Boundaries and Surface Diffusion of Copper Investigated by AFM <i>M. Göken, M. Marx, H. Vehoff, Th. Weber, Universität des Saarlandes, Saarbrücken (D)</i> ..	208
Development of Cu/Cu Interconnections Using an Indium Interlayer <i>S.K. Bhatnagar, P.K. Khanna, Central Electronics Engineering Research Institute, Pilani, Rajasthan (IND); L. Litynska, P. Zieba, Polish Academy of Sciences, Cracow (PL); W. Gust, E.J. Mittemeijer, S. Sommadossi, University of Stuttgart (D)</i> .....	214
Novel Ni/Al/Ni Diffusion Soldered Joints for High Temperature Applications <i>P.K. Khanna, Central Electronics Engineering Research Institute, Pilani, Rajasthan (IND); L.S. Chang, National Chung-Hsing University, Taichung (RC); E. Bielanska, P. Zieba, Polish Academy of Sciences, Cracow (PL); W. Gust, G. Lopez, E.J. Mittemeijer, S. Sommadossi, University of Stuttgart (D)</i> .....	219
Degradation of the Shape Memory Effect <i>A. C. Kneissl, A. G. Mayer, H. Scherngell, University of Leoben (A)</i> .....	225
Quantitative Analysis of the Pore Structure of Sintered Parts <i>H.-P. Koch, Robert Bosch GmbH, Stuttgart (D); T. Bernthaler, U. Klauk, G. Schneider, B. Stahl, University of Applied Science, FH Aalen (D)</i>	231
Damage Mode and Crack Propagation in Dental Layer Ceramics <i>J.-W. Chung, Dong Sue Trading Co., Ltd., Seoul (ROK); Y.-G. Jung, Changwon Natl. Univ., Kyungnam (ROK); S.-Ch. Choi, Hanyang Univ., Seoul (ROK)</i> .....	235
Positron Annihilation: A New Method for Studying Subnanometer-Size Local Free Volumes in Polymers <i>N. Meyendorf, Fraunhofer IZFP, Saarbrücken (D); G. Dlubek, ITA Institut Köthen/Halle (D); H. M. Fretwell, University of Bristol</i> .....	241
Texture Measurements of Electrical Steels Alloyed with Tin <i>M. Gode, M. Jenko, Institute of Metals and Technology, Ljubljana (SLO) ; H. J. Grabke, R. Mast, Max-Planck-Institute for Iron Research, Düsseldorf (D)</i> .....	247
Crystallographic Mapping in the Transmission Electron Microscope <i>D. J. Dingley, St. I. Wright, TexSEM Laboratories, Draper, Utah (USA)</i> .....	253

X-ray Substructure Analysis in Polycrystalline Magnesium Compressed at Different Strain Rates and Temperatures <i>P. Klimanek, A. Pöttsch, Freiberg University of Mining and Technology (D)</i> .....	261
Development of the Microstructure of Low-Carbon and Interstitial-Free steel during Annealing as Studied by in-situ X-Ray Diffraction <i>A. Burghardt, P. van Popta, J. Vrieze, L. Woning, Applied Physical Metallurgy, Hoogovens Research &amp; Development, IJmuiden (NL)</i> .....	265
<b>Author Index</b> .....	271
<b>Subject Index</b> .....	273