

Wrocław University of Technology  
Centre of Advanced Materials and Nanotechnology

---

# Materials Science

**Contents of Volume 21**  
**Author Index**  
**Key word index**

Vol. 21



2003



Oficyna Wydawnicza Politechniki Wrocławskiej

**Editorial Office**

Łukasz Maciejewski

**Editorial Layout**

Hanna Basarowa

Printed in Poland

© Copyright by Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2003

Drukarnia Oficyny Wydawniczej Politechniki Wrocławskiej

## Contents of volume 21

### No. 1

#### Papers presented at the 7<sup>th</sup> Korean-Polish Joint Seminar on Physical Properties of Magnetic Materials, Warszawa, Poland

Professor Bogusław Kędzia	5
From the Guest Editors	7
C. Gi Kim, C.-O. Kim, Y. Hu, J. Kanak, T. Stobiecki, S. Ogata, M. Tsunoda, M. Takahashi, Structure analysis and local magnetic parameters of magnetoresistance tunnel junctions	9
T. Luciński, M. Kopcewicz, A. Hütten, H. Brückl, S. Heitmann, T. Hempel, G. Reiss, Magnetic properties of Fe/Si and Co/Si multilayers	25
D. -G. Hwang, Rotational anisotropy in exchange-biased NiFe/FeMn bilayers	39
J. Y. Hwang, J.R. Rhee, Exchange coupling field in top, bottom, and dual-type IrMn spin valves coupled to CoFe	47
J. Wrona, T. Stobiecki, M. Czapkiewicz, R. Rak, Magnetometry of monoatomic layers and spin electronics elements	55
D. H. Kim, I.T. Nam, Y.K. Hong, The effect of underlayers on grain orientation and magnetic properties of barium-ferrite thin film	65
B. Idzikowski, A. Szajek, Magnetism of nanocrystalline and bulk $\text{Fe}_x\text{Ni}_{23-x}\text{B}_6$ ( $x = 0, 1, 22$ and $23$ ) alloys – experiment and theory	73
A. Ślawska-Waniewska, Effective magnetostriction in nanocrystalline alloys	83
O. Nedelko, A. Ślawska-Waniewska, Y. Labaye, Micromagnetic simulation of multiphase nanocrystalline material with different boundary conditions	93
B. T. Cięciwa, L.J. Maksymowicz, M. Lubecka, H. Jankowski, J. Sokulski, Z. Sobków, Influence of indium dilution level on magnetic properties and photoconductivity of $\text{Cd}_{1-y}\text{Cr}_{2-2y}\text{In}_{2x+y}\text{Se}_4$ magnetic semiconductors	99
W. Suski, B. Belan, A. Gilewski, T. Mydlarz, K. Wochowski, Magnetic properties of the $\text{RMn}_{12-x}\text{T}_x$ alloys in high magnetic field	107
H. Lee, Y.-S. Kim, S.-C. Yu, High-frequency magnetoimpedance effect in glass-coated amorphous $\text{Co}_{83.2}\text{B}_{3.3}\text{Si}_{5.9}\text{Mn}_{7.6}$ microwires	115
H. K. Lachowicz, M. Kuźmiński, S.-C. Yu, The effect of axial dc-field on transverse permeability in Co-based metallic glass ribbons	123
M. -H. Phan, S.-C. Yu, A.N. Ulyanov, H.K. Lachowicz, Large magnetocaloric effect in perovskite manganites: changes of the magnetic entropy above 300 K	133
Y. B. Kim, H.T. Kim, S.H. Cho, G.A. Kapustin, Microstructure and magnetic properties of NdFeB magnets fabricated by current-applied pressure-assisted process	141
W. Y. Jeung, D.H. Choi, K.H. Lee, Effects of an external magnetic field on the perpendicular magnetic anisotropy of electrodeposited micro-patterned arrays	147

## No. 2

## Towards molecular magnets

- J. Mroziński, A. Tomkiewicz, M. Nahorska, B. Korybut-Daszkiewicz, New trends in the investigations of macrocyclic magnets 161
- T. Kotera, A. Fujita, M. Mikuriya, M. Handa, Thiolato-bridged copper complexes with N,N,S-tridentate ligands 171
- N. Kojima, M. Itoi, Y. Ono, M. Okubo, M. Enomoto, Spin-entropy driven charge-transfer phase transition in iron mixed-valence system 181
- H. Ohta, Y. Sunatsuki, Y. Ikuta, N. Matsumoto, S. Iijima, H. Akashi, T. Kambe, M. Kojima, Spin crossover in a supramolecular Fe<sup>II</sup>-Fe<sup>III</sup> system 191
- M. Handa, Y. Sayama, M. Mikuriya, I. Hiromitsu, K. Kasuga, Structural effects on magnetism of pyridyl nitroxide complexes of ruthenium(II, III) pivalate dimers 199
- N. Imai, T. Hamaguchi, T. Yamaguchi, T. Ito, Intramolecular electron transfer on the vibrational timescale in mixed valence ruthenium clusters 207
- Yu.V. Yablokov, V.V. Zelentsov, M. Augustyniak-Jabłokow, A. Krupska, J. Mroziński, The study of the spin transition process in Na[Fe(Th-Sa)<sub>2</sub>] by electron paramagnetic resonance 215

## Regular papers

- Z. Zainal, S. Nagalingam, A. Kassim, W.M.M. Yunus, Tin selenide thin films prepared through combination of chemical precipitation and vacuum evaporation technique 225
- I. Labádi, I. Szilágyi, N.I. Jakab, K. Hernádi, I. Pálinkó, Metal complexes immobilised in/on porous matrices – possible enzyme mimics 235
- I. Szymańska, R. Kucharek, E. Szlyk, Copper(I) complexes as potential CVD precursors – studies in the liquid state and gas phase 245
- D. W.O. de Medeiros, D.S. dos Santos, T.N.C. Dantas, M.R. Pereira, J.A. Giacometti, J.L.C. Fonseca, Zeta potential and doping in polyaniline dispersions 251

## No. 3

## Nanotesting

- J. Misiewicz, P. Sitarek, G. Sęk, R. Kudrawiec, Semiconductor heterostructures and device structures investigated by photoreflectance spectroscopy 263
- J. Radojewski, P. Grabiec, Combined SNOM/AFM microscopy with micromachined nanoapertures 319
- T. Gotszalk, P. Grabiec, I. W. Rangelow, Application of electrostatic force microscopy in nano-system diagnostics 333
- R. F. Szeloch, W. M. Posadowski, T. P. Gotszalk, P. Janus, T. Kowaliw, Thermal characterization of copper thin films made by means of sputtering 339
- J. Kozłowski, J. Serafińczuk, A. Kozik, Wavelet shrinkage-based noise reduction from the high resolution X-ray images of epitaxial layers 345

## Regular papers

- N. V. Tristan, T. Palewski, H. Drulis, L. Folcik, S.A. Nikitin, Hydrogenation process of Gd<sub>3</sub>Ni 357

## No. 4

**Papers presented at the International Conference  
on Sol-Gel Materials SGM 2003, Szklarska Poręba, Poland**

E. Szałkowska, J. Masalski, J. Głuszek, Electrochemical evaluation of protective properties of one-component SiO <sub>2</sub> and TiO <sub>2</sub> coatings obtained by the sol-gel method	367
W. Tylus, CeMn/AlSiO ceramic layers on metallic supports for high-temperature catalytic processes	377
J. G. Chęćmanowski, J. Głuszek, J. Masalski, The effect of sequence of sol-gel multilayer coatings deposition on corrosion behaviour of stainless steel 316L	387
M. Przybyt, Behaviour of glucose oxidase during formation and ageing of silica gel studied by fluorescence spectroscopy	397
M. Przybyt, Potentiometric tungsten electrodes with enzymes immobilised by the sol-gel technique	417
M. Płońska, D. Czekaj, Z. Surowiak, Application of the sol-gel method to the synthesis of ferroelectric nanopowders (Pb <sub>1-x</sub> La <sub>x</sub> )(Zr <sub>0.65</sub> Ti <sub>0.35</sub> ) <sub>1-0.25x</sub> O <sub>3</sub> , 0.06 ≤ x ≤ 0.1	431
A. Zarycka, J. Ilczuk, D. Czekaj, Application of the sol-gel method to deposition of thin films	439
A. Biedunkiewicz, Crystallisation of TiC and TiN from a colloidal system	445
M. Opallo, Silicate solvated by an organic solvent as electrolyte or electrode material	453
J. Chruściel, L. Ślusarski, Synthesis of nanosilica by the sol-gel method and its activity toward polymers	461
M. Nocuń, E. Leja, W. Bugajski, Microstructure and optical properties of methylmethacrylate-modified silica hybrid glasses and thin films	471
V. E. Gaishun, Y.A. Potapenok, O.I. Tulenkova, S.V. Pakhovtchysin, W. Stręk, Rheology of silica suspensions stabilized by ethylenediamine	481
A. Ulatowska-Jarża, M. Komorowska, H. Podbielska, EPR studies of defects in pure sol-gel matrices and their influence on cytotoxicity of the material	487
S. V. Shalupaev, A.V. Semchenko, Y.V. Nikityuk, Silica gel glasses after laser irradiation	495

## Author Index

Akashi H. see Ohta H.	191*
Augustyniak-Jabłokow M. see Yablokov Yu.V.	215
Belan B. see Suski W.	107
Biedunkiewicz, A. Crystallisation of TiC and TiN from a colloidal system	445
Brückl H. see Luciński T.	25
Bugajski W. see Nocuń M.	471
Chęcmanowski J.G., J. Głuszek, J. Masalski, The effect of sequence of sol-gel multilayer coatings deposition on corrosion behaviour of stainless steel 316L	387
Cho S.H. see Kim Y.B.	141
Choi D.H. see Jeung W.Y.	147
Chruściel J., L. Ślusarski, Synthesis of nanosilica by the sol-gel method and its activity toward polymers	461
Cięciwa B.T., L.J. Maksymowicz, M. Lubecka, H. Jankowski, J. Sokulski, Z. Sobków, Influence of indium dilution level on magnetic properties and photoconductivity of $Cd_{1-y}Cr_{2-2x}In_{2x+y}Se_4$ magnetic semiconductors	99
Czapkiewicz M. see Wrona J.	55
Czekaj D. see Płońska M.	431
Czekaj D. see Zarycka A.	439
Dantas T.N.C. see de Medeiros D.W.O.	251
de Medeiros, D.W.O., D.S. dos Santos, T.N.C. Dantas, M.R. Pereira, J.A. Giacometti, J.L.C. Fonseca, Zeta potential and doping in polyaniline dispersions	251
dos Santos D.S. see de Medeiros D.W.O.	251
Drulis H. see Tristan N.V.	357
Enomoto M. see Kojima N.	181
Folcik L. see Tristan N.V.	357
Fonseca J.L.C. see de Medeiros D.W.O.	251
Fujita A. see Kotera T.	171
Gaishun V.E., Y.A. Potapenok, O.I. Tulenkova, S.V. Pakhovtchysin, W. Stręk, Rheology of silica suspensions stabilized by ethylenediamine	481
Giacometti J.A. see de Medeiros D.W.O.	251
Gilewski A. see Suski W.	107
Głuszek J. see Chęcmanowski J.G.	387
Głuszek J. see Szalkowska E.	367
Gotszalk T., P. Grabiec, I. W. Rangelow, Application of electrostatic force microscopy in nanosystem diagnostics	333
Gotszalk T.P. see Szeloch R.F.	339
Grabiec P. see Gotszalk T.	333
Grabiec P. see Radojewski J.	319
Hamaguchi T. see Imai N.	207
Handa M. see Kotera T.	171

---

\*Page number/Issue number.

Handa M., Y. Sayama, M. Mikuriya, I. Hiromitsu, K. Kasuga, Structural effects on magnetism of pyridyl nitroxide complexes of ruthenium(II, III) pivalate dimers	199
Heitmann S. see Luciński T.	25
Hempel T. see Luciński T.	25
Hernádi K. see Labádi I.	235
Hiromitsu I. see Handa M.	199
Hong Y.K. see Kim D.H.	65
Hu Y. see Kim C.Gi	9
Hütten A. see Luciński T.	25
Hwang D.-G., Rotational anisotropy in exchange-biased NiFe/FeMn bilayers	39
Hwang J.Y., J.R. Rhee, Exchange coupling field in top, bottom, and dual-type IrMn spin valves coupled to CoFe	47
Idzikowski B., A. Szajek, Magnetism of nanocrystalline and bulk $\text{Fe}_x\text{Ni}_{23-x}\text{B}_6$ ( $x = 0, 1, 22$ and $23$ ) alloys – experiment and theory	73
Iijima S. see Ohta H.	191
Ikuta Y. see Ohta H.	191
Ilczuk J. see Zarycka A.	439
Imai N., T. Hamaguchi, T. Yamaguchi, T. Ito, Intramolecular electron transfer on the vibrational timescale in mixed valence ruthenium clusters	207
Ito T. see Imai N.	207
Itoi M. see Kojima N.	181
Jakab N.I. see Labádi I.	235
Jankowski H. see Cięciwa B.T.	99
Janus P. see Szeloch R.F.	339
Jeung W.Y., D.H. Choi, K.H. Lee, Effects of an external magnetic field on the perpendicular magnetic anisotropy of electrodeposited micro-patterned arrays	147
Kambe T. see Ohta H.	191
Kanak J. see Kim C.Gi	9
Kapustin G.A. see Kim Y.B.	141
Kassim A. see Zainal Z.	225
Kasuga K. see Handa M.	199
Kim C.Gi, C.-O. Kim, Y.Hu, J. Kanak, T. Stobiecki, S. Ogata, M. Tsunoda, M. Takahashi, Structure analysis and local magnetic parameters of magnetoresistance tunnel junctions	9
Kim C.-O. see Kim C.Gi	9
Kim D.H., I.T. Nam, Y.K. Hong, The effect of underlayers on grain orientation and magnetic properties of barium-ferrite thin film	65
Kim H.T. see Kim Y.B.	141
Kim Y.B., H.T. Kim, S.H. Cho, G.A. Kapustin, Microstructure and magnetic properties of NdFeB magnets fabricated by current-applied pressure-assisted process	141
Kim Y.-S. see Lee H.	115
Kojima M. see Ohta H.	191
Kojima N., M. Itoi, Y. Ono, M. Okubo, M. Enomoto, Spin-entropy driven charge-transfer phase transition in iron mixed-valence system	181
Komorowska M. see Ulatowska-Jarża A.	487
Kopcewicz M. see Luciński T.	25
Korybut-Daszkiewicz B. see Mroziński J.	161
Kotera T., A. Fujita, M. Mikuriya, M. Handa, Thiolato-bridged copper complexes with N,N,S-tridentate ligands	171
Kowaliw T. see Szeloch R.F.	339
Kozik A. see Kozłowski J.	345

Kozłowski J., J. Serafińczuk, A. Kozik, Wavelet shrinkage-based noise reduction from the high resolution X-ray images of epitaxial layers	345
Krupska A. see Yablokov Yu.V.	215
Kucharek R. see Szymańska I.	245
Kudrawiec R. see Misiewicz J.	263
Kuźmiński M. see Lachowicz H.K.	123
Labádi I., I. Szilágyi, N.I. Jakab, K. Hernádi, I. Pálinkó, Metal complexes immobilised in/on porous matrices – possible enzyme mimics	235
Labaye Y. see Nedelko O.	93
Lachowicz H.K., M. Kuźmiński, S.-C. Yu, The effect of axial dc-field on transverse permeability in Co-based metallic glass ribbons	123
Lachowicz H.K. see Phan M.-H.	133
Lee H., Y.-S. Kim, S.-C. Yu, High-frequency magnetoimpedance effect in glass-coated amorphous $\text{Co}_{83.2}\text{B}_{3.3}\text{Si}_{5.9}\text{Mn}_{7.6}$ microwires	115
Lee K.H. see Jeung W.Y.	147
Leja E. see Nocuń M.	471
Lubecka M. see Cięciwa B.T.	99
Luciński T., M. Kopewicz, A. Hütten, H. Brückl, S. Heitmann, T. Hempel, G. Reiss, Magnetic properties of Fe/Si and Co/Si multilayers	25
Maksymowicz L.J. see Cięciwa B.T.	99
Masalski J. see Chęćmanowski J.G.	387
Masalski J. see Szalkowska E.	367
Matsumoto N. see Ohta H.	191
Medeiros de D.W.O. see de Medeiros D.W.O.	251
Mikuriya M. see Handa M.	199
Mikuriya M. see Kotera T.	171
Misiewicz J., P. Sitarek, G. Sęk, R. Kudrawiec, Semiconductor heterostructures and device structures investigated by photoreflectance spectroscopy	263
Mroziński J., A. Tomkiewicz, M. Nahorska, B. Korybut-Daszkiewicz, New trends in the investigations of macrocyclic magnets	161
Mroziński J. see Yablokov Yu.V.	215
Mydlarz T. see Suski W.	107
Nagalingam S. see Zainal Z.	225
Nahorska M. see Mroziński J.	161
Nam I.T. see Kim D.H.	65
Nedelko O., A. Ślawska-Waniewska, Y. Labaye, Micromagnetic simulation of multiphase nanocrystalline material with different boundary conditions	93
Nikitin S.A. see Tristan N.V.	357
Nikityuk Y.V. see Shalupaev S.V.	495
Nocuń M., E. Leja, W. Bugajski, Microstructure and optical properties of methylmethacrylate-modified silica hybrid glasses and thin films	471
Ogata S. see Kim C.Gi	9
Ohta H., Y. Sunatsuki, Y. Ikuta, N. Matsumoto, S. Iijima, H. Akashi, T. Kambe, M. Kojima, Spin crossover in a supramolecular $\text{Fe}^{\text{II}}\text{-Fe}^{\text{III}}$ system	191
Okubo M. see Kojima N.	181
Ono Y. see Kojima N.	181
Opallo M., Silicate solvated by an organic solvent as electrolyte or electrode material	453
Pakhovtchysin S.V. see Gaishun V.E.	481
Palewski T. see Tristan N.V.	357
Pálinkó I. see Labádi I.	235



Pereira M.R. see de Medeiros D.W.O.	251
Phan M.-H., S.-C. Yu, A.N. Ulyanov, H.K. Lachowicz, Large magnetocaloric effect in perovskite manganites: changes of the magnetic entropy above 300 K	133
Płońska M., D. Czekaj, Z. Surowiak, Application of the sol-gel method to the synthesis of ferroelectric nanopowders $(\text{Pb}_{1-x}\text{La}_x)(\text{Zr}_{0.65}\text{Ti}_{0.35})_{1-0.25x}\text{O}_3$ , $0.06 \leq x \leq 0.1$	431
Podbielska H. see Ulatowska-Jarża A.	487
Posadowski W.M. see Szeloch R.F.	339
Potapenok Y.A. see Gaishun V.E.	481
Przybyt M., Behaviour of glucose oxidase during formation and ageing of silica gel studied by fluorescence spectroscopy	397
Przybyt M., Potentiometric tungsten electrodes with enzymes immobilised by the sol-gel technique	417
Radojewski J., P. Grabiec, Combined SNOM/AFM microscopy with micromachined nanoapertures	319
Rak R. see Wrona J.	55
Rangelow I.W. see Gotszalk T.	333
Reiss G. see Luciński T.	25
Rhee J.R. see Hwang J.Y.	47
Santos dos D.S. see dos Santos D.S.	251
Sayama Y. see Handa M.	199
Semchenko A.V. see Shalupaev S.V.	495
Serafińczuk J. see Kozłowski J.	345
Sęk G. see Misiewicz J.	263
Shalupaev S.V., A.V. Semchenko, Y.V. Nikityuk, Silica gel glasses after laser irradiation	495
Sitarek P. see Misiewicz J.	263
Sobków Z. see Cięciwa B.T.	99
Sokulski J. see Cięciwa B.T.	99
Stobiecki T. see Kim C.Gi	9
Stobiecki T. see Wrona J.	55
Stręk W. see Gaishun V.E.	481
Sunatsuki Y. see Ohta H.	191
Surowiak Z. see Płońska M.	431
Suski W., B. Belan, A. Gilewski, T. Mydlarz, K. Wochowski, Magnetic properties of the $\text{RMn}_{12-x}\text{T}_x$ alloys in high magnetic field	107
Szajek A. see Idzikowski B.	73
Szałkowska E., J. Masalski, J. Gluszek, Electrochemical evaluation of protective properties of one-component $\text{SiO}_2$ and $\text{TiO}_2$ coatings obtained by the sol-gel method	367
Szeloch R.F., W. M. Posadowski, T. P. Gotszalk, P. Janus, T. Kowaliw, Thermal characterization of copper thin films made by means of sputtering	339
Szilágyi I. see Labádi I.	235
Szłyk E. see Szymańska I.	245
Szymańska I., R. Kucharek, E. Szlyk, Copper(I) complexes as potential CVD precursors – studies in the liquid state and gas phase	245
Ślawska-Waniewska A., Effective magnetostriction in nanocrystalline alloys	83
Ślawska-Waniewska A. see Nedelko O.	93
Ślusarski L. see Chruściel J.	461
Takahashi M. see Kim C.Gi	9
Tomkiewicz A. see Mroziński J.	161
Tristan N.V., T. Palewski, H. Drulis, L. Folcik, S.A. Nikitin, Hydrogenation process of $\text{Gd}_3\text{Ni}$	357
Tsunoda M. see Kim C.Gi	9
Tulenkova O.I. see Gaishun V.E.	481

Tylus W., CeMn/AlSiO ceramic layers on metallic supports for high-temperature catalytic processes	377
Ulatowska-Jarża A., M. Komorowska, H. Podbielska, EPR studies of defects in pure sol-gel matrices and their influence on cytotoxicity of the material	487
Ulyanov A.N. see Phan M.-H.	133
Wochowski K. see Suski W.	107
Wrona J., T. Stobiecki, M. Czapkiewicz, R. Rak, Magnetometry of monoatomic layers and spin electronics elements	55
Yablokov Yu.V., V.V. Zelentsov, M. Augustyniak-Jablokow, A. Krupska, J. Mroziński, The study of the spin transition process in Na[Fe(Th-Sa) <sub>2</sub> ] by electron paramagnetic resonance	215
Yamaguchi T. see Imai N.	207
Yu S.-C. see Lachowicz H.K.	123
Yu S.-C. see Lee H.	115
Yu S.-C. see Phan M.-H.	133
Yunus W.M.M. see Zainal Z.	225
Zainal Z., S. Nagalingam, A. Kassim, W.M.M. Yunus, Tin selenide thin films prepared through combination of chemical precipitation and vacuum evaporation technique	225
Zarycka A., J. Ilczuk, D. Czekaj, Application of the sol-gel method to deposition of thin films	439
Zelentsov V.V. see Yablokov Yu.V.	215

## Key Word Index\*

AF	319	entropy	133
amorphous alloys	73	enzyme stability	397
anchoring	235	epitaxial layer	345
anisotropy	65	ethylenediamine	481
antiferromagnet	39	evaporation	225
		exchange biasing	39
BaM film	65	exchange coupling field	47
blocking temperature	47	exchange coupling	9
cantilever technology	319	ferroelectric ceramics	439
capacitance	333	ferroelectric properties	431
CAPA-process	141	ferromagnetism	181
ceramic layer	377	flavin adeninedinucleotide	397
ceramics	431	fluorescence	397
chain complexes	199	FT-IR spectroscopy	235
charge-transfer	181		
coatings	445	(Gd <sub>3</sub> Ni)H <sub>x</sub>	357
cobalt	147	giant magnetoimpedance	123
coercive force	9	glucose oxidase	397, 417
coercivity	65		
composites	445	heterobimetallic magnets	161
copper	339	hexanuclear complexes	171
copper(II)	161	high magnetic field	107
crossover in Na[Fe(Th-Sa) <sub>2</sub>	215	high-temperature corrosion	377
crystalline texture	47	host-guest substances	235
Cu(histidine) complexes	235	hot-working	141
Cu(I) complexes	245	hybrid glasses	471
CVD precursors	245	hydrogen bonds	191
cytotoxicity	487	hydrogenation	357
		hysteresis loop	93
density of states	73		
doping	251	immobilisation	235
double exchange	133	impedance	367
		inorganic-organic glasses	471
electric field	263	interfaces	83
electrode	453	interlayer coupling	25
electrodeposition	147	ion transfer	453
electron paramagnetic resonance (EPR)	487		
electrophoretic mobility	251	local magnetic moments	73
electrostatic force microscopy	333	low-dimensional structures	263

\* Page number/Issue number.

low-spin complexes	215	polyaniline	251
magnetic behaviour	161	potentiodynamic curves	367, 387
magnetic field	147	potentiometric enzyme electrode	417
magnetic monoatomic layers	55	pyridyl nitroxide radical	199
magnetic properties	107	PZT	439
magnetic refrigeration	133	rare-earth intermetallics	107
magnetic semiconductor	99	redox liquid	453
magnetic sensors	115	reentrant transition	99
magnetocaloric effect	133	rheological properties	481
magnetoimpedance effect	115	rotational anisotropy	39
magnetometry	55	Ru(II, III) dimer	199
magneto-optical Kerr effect (MOKE)	55	ruthenium clusters	207
magnetoresistance	25	scanning thermal microscopy	339
magnetostriction	83	semiconductor devices	263
magnetron	339	silica gel	235
metallic glass	123	silica glasses	495
microcracks	495	silica	481
micromagnetic simulations	93	silicate	453
microstructure	65, 471	skin effect	123
microwires	115	SNOM microscopy	319
mixed valence complexes	171, 207	soft magnets	83
mixed valence	181	sol-gel method	367, 431, 439, 445, 495
modification of polymers	461	sol-gel	377, 387, 397, 417, 453, 461, 487,
MOKE	9	solid electrolyte	453
MR ratio	47	spectral coalescence	207
multilayers	25	spin crossover	181, 191
Na-montmorillonite	235	spin electronics	55
nanoaperture	319	spin glass	99
nanocrystalline materials	83, 93	spin valve	47
nanocrystallization	73	sputtering	339
nanopowders	431	structural instability	357
nanosilica	387, 461	structural transformation	357
nanosystem	333	surface roughness	9
NdFeB	141	surfactant	387
nickel(III) and rhenium(IV) complexes	161	suspension	481
optical properties	471	thermosplitting	495
penetration depth	123	thin film	225
perfluorinated carboxylates	245	thin layers	471
permanent magnet	141	thiolato-bridged complexes	171
perovskite	133	tin selenide	225
perpendicular anisotropy	147	titanium carbide	445
phase transition	181	titanium nitride	445
photoconductivity	99	TMR	9
photoelectrochemical cell	225	transverse permeability	123
photorefectance	263	trimethyl phosphite	245
PLZT	431, 439	tripodal ligand	191

tyrosinase	417		
underlayer	65	wet corrosion	387
urease	417	xerogel	487
		XPS method	367
vibration sample magnetometer (VSM)	55	X-ray	345
viscosity	481	XRD	9
voltage distribution	333		
wavelet	345	zeta potential	251