

Volume 561

5 June 2013  
ISSN 0925-8388



# Journal of ALLOYS AND COMPOUNDS

**An Interdisciplinary Journal  
of Materials Science and  
Solid-State Chemistry and Physics**

**EDITOR-IN-CHIEF**

L. SCHULTZ

**EDITORS**

K.H.J. BUSCHOW

J. CHAN

D.G. ESKIN

H. FAN

J.-M. GRENECHE

V.G. HARRIS

H. KLEINKE

C. KOCH

H.G. PAN

V. PECHARSKY

H. SAKAGUCHI

H. ZUR LOYE





ELSEVIER

Contents lists available at ScienceDirect

# Journal of Alloys and Compounds

journal homepage: [www.elsevier.com/locate/jallcom](http://www.elsevier.com/locate/jallcom)

## Contents

**Abstracting Services** Abstracted/indexed in: Cambridge Scientific Abstracts, Ceramics Abstracts, Chemical Abstracts, Current Contents, Engineering Index, FIZ Karlsruhe, Metals Abstracts, PASCAL/CNRS, Physics Abstracts, Physikalische Berichte, Research Alert, Science Citation Index. Also covered in the abstract and citation database SCOPUS.<sup>®</sup> Full text available on ScienceDirect.<sup>®</sup>

Reaction mechanism for combustion synthesis of $\beta$ -SiAlON by using Si, Al, and SiO <sub>2</sub> as raw materials X. Yi (Shaanxi, China, Sapporo, Japan), J. Niu, T. Nakamura and T. Akiyama (Sapporo, Japan) . . . . .	1
Stability of medium range order in Al-based metallic glass compacted by severe plastic deformation Zs. Kovács, P. Henits, L.K. Varga (Budapest, Hungary), E. Schafner (Vienna, Austria) and Á. Révész (Budapest, Hungary) . . . . .	5
Directly hydrothermal growth of CdIn <sub>2</sub> S <sub>4</sub> nanosheet films on FTO substrates for photoelectric application W. Zhang, H. Yang, W. Fu, M. Li, Y. Li and W. Yu (Changchun, PR China) . . . . .	10
Structural, elastic, electronic and optical properties of beryllium chalcogenides BeX (X = S, Se, Te) with zinc-blende structure L. Guo, G. Hu, S. Zhang (Chongqing, PR China), W. Feng (Shenyang, PR China) and Z. Zhang (Dalian, PR China) . . . . .	16
Effect of reaction temperature on crystallization of nanocrystalline zirconia synthesized by microwave-hydrothermal process C. Li, K. Li, H. Li, Y. Zhang, H. Ouyang, L. Liu and C. Sun (Shaanxi, PR China) . . . . .	23
Analysis of the photovoltaic properties of n-type compensated silicon solar cells with the Al-alloyed emitter C. Xiao, D. Yang, X. Yu, R. Wang and D. Que (Hangzhou, People's Republic of China) . . . . .	28
Surface study of chemically modified TiO <sub>2</sub> films for use in low temperature dye-sensitised solar cells D.K. Mishra and J.-M. Ting (Tainan, Taiwan) . . . . .	33
Synthesis, characterization and impedance spectroscopy study of magnetite/epoxidized natural rubber nanocomposites W.L. Tan and M. Abu Bakar (Penang, Malaysia) . . . . .	40
Transformation from Al <sub>3</sub> BC phase to doped TiB <sub>2</sub> or TiC particles in Al-Ti melts W. Tian, P. Li, T. Gao, J. Nie and X. Liu (Jinan, China) . . . . .	48
High rate capability of TiO <sub>2</sub> /nitrogen-doped graphene nanocomposite as an anode material for lithium-ion batteries D. Cai, D. Li, S. Wang (Guangzhou, China), X. Zhu, W. Yang (Dalian, China), S. Zhang (Australia) and H. Wang (Guangzhou, China) . . . . .	54
Spectroscopic properties of Na(Sr,Ba)VO <sub>4</sub> :Eu <sup>3+</sup> novel red-emitting phosphors for solid state lighting applications C.R. Kesavulu (Changwon, Republic of Korea), D.G. Lee, S.S. Yi (Busan, Republic of Korea), K. Jang (Changwon, Republic of Korea), J.H. Park, J.S. Leem, Y.H. Choi, Y.J. Jang and J.G. Choi (Busan, Republic of Korea) . . . . .	59
Enhanced microwave absorption properties of carbonyl iron/Fe <sub>3</sub> O <sub>4</sub> composites synthesized by a simple hydrothermal method Q. Liu (Hefe, Huaibei, People's Republic of China), Z. Zi, M. Zhang (Hefe, People's Republic of China), A. Pang (Huaibei, People's Republic of China), J. Dai (Hefe, Huaibei, People's Republic of China) and Y. Sun (Hefe, People's Republic of China) . . . . .	65
Magnetoimpedance effects in a CoNiFe nanowire array S. Atalay, H. Kaya, F.E. Atalay and E. Aydogmus (Malatya, Turkey) . . . . .	71
Effect of Cu addition on nanocrystallization behaviors and magnetic properties of the Fe <sub>76.5-x</sub> C <sub>6.0</sub> Si <sub>3.3</sub> B <sub>5.5</sub> P <sub>8.7</sub> Cu <sub>x</sub> (x = 0–3at.%) bulk metallic glass H.Y. Jung and S. Yi (Daegu, South Korea) . . . . .	76
Magnetic ordering in TlFe <sub>1.3</sub> Se <sub>2</sub> studied by Mössbauer spectroscopy Z.M. Stadnik (Ontario, Canada), P. Wang (Beijing, China), H.-D. Wang, C.-H. Dong and M.-H. Fang (Hangzhou, China) . . . . .	82
X-ray absorption near-edge structure of hexagonal ternary phases in sputter-deposited TiAlN films R. Gago (Madrid, Spain), F. Soldera (Saarbruecken, Germany), R. Hübner, J. Lehmann, F. Munnik (Dresden, Germany), L. Vázquez (Madrid, Spain), A. Redondo-Cubero (Sacavém, Portugal) and J.L. Endrino (Madrid, Seville, Spain) . . . . .	87
Preparation of La <sub>0.7</sub> Sr <sub>0.3</sub> Mn <sub>1+x</sub> O <sub>y</sub> (1 ≤ x ≤ 4) thin films by chemical solution deposition: Dual epitaxy and possible spinodal growth H. Jian, Z. Zhang, Y. Wang, X. Tang, J. Yang, L. Hu, L. Chen, X. Zhu and Y. Sun (Hefe, PR China) . . . . .	95
Low-temperature magnetic properties of RE <sub>2</sub> Ni <sub>21</sub> B <sub>6</sub> (RE = Er, Tm, Yb and Lu) J. Kitagawa (Fukuoka, Japan), N. Takeda (Niigata, Japan) and M. Ishikawa (Chiba, Japan) . . . . .	101
Effects of bismuth doping on the thermoelectric properties of Cu <sub>3</sub> SbSe <sub>4</sub> at moderate temperatures X.Y. Li, D. Li, H.X. Xin, J. Zhang, C.J. Song and X.Y. Qin (Hefe, People's Republic of China) . . . . .	105



Structure and photoluminescence of TiO <sub>2</sub> nanocrystals doped and co-doped with N and rare earths (Y <sup>3+</sup> , Pr <sup>3+</sup> ) P.C. Ricci, C.M. Carbonaro, A. Geddo Lehmann, F. Congiu, B. Puxeddu (Monserrato (CA), Italy), G. Cappelletti and F. Spadavecchia (Milano, Italy) . . . . .	109
Enhanced photoelectrochemical properties of 100 MeV Si <sup>8+</sup> ion irradiated barium titanate thin films A. Solanki, S. Choudhary, V.R. Satsangi, R. Shrivastav and S. Dass (Agra, India). . . . .	114
Magnetic properties of Ba <sub>x</sub> Sr <sub>1-x</sub> Fe <sub>12</sub> O <sub>19</sub> (x = 0.05–0.35) ferrites prepared by different methods M. Cernea, S.-G. Sandu (Bucharest-Magurele, Romania), C. Galassi (Faenza, Italy), R. Radu and V. Kuncser (Bucharest-Magurele, Romania)	121
Electrochemical performance of WO <sub>2</sub> modified LiFePO <sub>4</sub> /C cathode material for lithium-ion batteries S. Liu (Jiangsu, Sichuan, PR China), H. Yin (Jiangsu, PR China), H. Wang and J. He (Sichuan, PR China). . . . .	129
Microstructural changes by heat treatment for single crystal superalloy exposed at high temperature H.-s. Lee, D.-h. Kim, D.-s. Kim and K.-b. Yoo (Daejeon, Republic of Korea) . . . . .	135
Structural and luminescence studies on Er <sup>3+</sup> /Yb <sup>3+</sup> co-doped boro-tellurite glasses K. Maheshvaran, S. Arunkumar (Gandhigram, India), V. Sudarsan, V. Natarajan (Mumbai, India) and K. Marimuthu (Gandhigram, India). . . . .	142
Optical properties of tellurite glasses elaborated within the TeO <sub>2</sub> -Ti <sub>2</sub> O-Ag <sub>2</sub> O and TeO <sub>2</sub> -ZnO-Ag <sub>2</sub> O ternary systems D. Linda (Limoges Cedex, France, Sfax, Tunisia), J.-R. Duclère (Limoges Cedex, France), T. Hayakawa (Nagoya, Japan), M. Dutreilh-Colas (Limoges Cedex, France), T. Cardinal (Pessac, France), A. Mirgorodsky (Limoges Cedex, France), A. Kabadou (Sfax, Tunisia) and P. Thomas (Limoges Cedex, France). . . . .	151
Experimental study of the Cu-Ni-Y system at 700 °C using diffusion couples and key alloys M. Mezbahul-Islam and M. Medraj (Montreal, Canada) . . . . .	161
Positive temperature coefficient of resistance of tetragonal Ti <sup>4+</sup> doped nano SrFeO <sub>3-δ</sub> A. Sendilkumar, K.C.J. Raju (Hyderabad, India), P.D. Babu (Mumbai, India) and S. Srinath (Hyderabad, India) . . . . .	174
Effect of deformation on the martensitic transformation of TiNi melt-spun ribbons H. Zheng, S. Xue, W. Wang, Q. Zhai (Shanghai, China) and Z. Luo (Fayetteville, USA). . . . .	180
Mechanical properties and corrosion resistance of Mg-10Gd-2Y-0.5Zr alloy by hot extrusion solid-state recycling J. Miao, B. Ye, Q. Wang and T. Peng (Shanghai, China) . . . . .	184
The effect of the growth rate on microsegregation: Experimental investigation in hypoeutectic Al-Fe and Al-Cu alloys directionally solidified E.S. Meza (Ponta Grossa, Brazil), F. Bertelli (Campinas, Brazil), P.R. Goulart (Itapetininga, Brazil), N. Cheung (São João da Boa Vista, Brazil) and A. Garcia (Campinas, Brazil) . . . . .	193
Covalent ligation of gold coated iron nanoparticles to the multi-walled carbon nanotubes employing click chemistry Md.R. Islam, L.G. Bach, T.T. Nga and K.T. Lim (Busan, Republic of Korea) . . . . .	201
Enhancing the efficiency of dye sensitized solar cells with an SnO <sub>2</sub> blocking layer grown by nanocluster deposition T.-T. Duong, H.-J. Choi (Daejeon, Republic of Korea), Q.-J. He (Shanghai, PR China), A.-T. Le (Hanoi, Viet Nam) and S.-G. Yoon (Daejeon, Republic of Korea). . . . .	206
Nanosheet-constructed transparent conducting ZnO:In thin films M. Wang, Y. Zhang, H. Yu, Q. Li (Zhenjiang, China), S.H. Hahn and E.J. Kim (Ulsan, South Korea) . . . . .	211
Strong luminescence enhancement of YVO <sub>4</sub> :Eu <sup>3+</sup> ,Ba <sup>2+</sup> phosphors prepared by a solvothermal method Y. Liao, N. Chen and G. Du (Jiangxi, China) . . . . .	214
The phase stability and mechanical properties of Nb-C system: Using first-principles calculations and nano-indentation L. Wu, Y. Wang, Z. Yan, J. Zhang, F. Xiao and B. Liao (Qinhuangdao, China) . . . . .	220
Depth-controllable ultra shallow Indium Gallium Zinc Oxide/Gallium Arsenide hetero junction diode S.-U. Yang, S.-H. Choi, J. Lee (Suwon, Republic of Korea), J. Kim (Yorktown Heights, USA), W.-S. Jung (Stanford, USA), H.-Y. Yu (Seoul, Republic of Korea), Y. Roh and J.-H. Park (Suwon, Republic of Korea) . . . . .	228
Electrical properties of phosphorus-doped polycrystalline germanium formed by solid-phase and metal-induced crystallization H.-W. Jung (Suwon, Republic of Korea), W.-S. Jung (Stanford, USA), H.-Y. Yu (Seoul, Republic of Korea) and J.-H. Park (Suwon, Republic of Korea) . . . . .	231
Er <sup>3+</sup> ions doped tellurite glasses with high thermal stability, elasticity, absorption intensity, emission cross section and their optical application E.S. Yousef (Abha, Saudi Arabia, Assiut, Egypt) . . . . .	234
On deformation behavior of a Ni-based bulk metallic glass produced by flux treatment D.V. Louzguine-Luzgin, D.M. Packwood, G. Xie (Sendai, Japan) and A.Yu. Churyumov (Moscow, Russia) . . . . .	241
Magnetic properties of ZnO(Co) nanocrystals I. Kuryliszyn-Kudelska (Warsaw, Poland), B. Hadžić (Serbia), D. Sibera (Poland), M. Romčević, N. Romčević (Belgrade, Serbia), U. Narkiewicz (Szczecin, Poland), W. Łojkowski, M. Arciszewska and W. Dobrowolski (Warsaw, Poland) . . . . .	247
Electrochemical intercalation of Li <sup>+</sup> into nanodomain Li <sub>4</sub> Mn <sub>5</sub> O <sub>12</sub> Sv. Ivanova, E. Zhecheva, D. Nihtianova, Ml. Mladenov and R. Stoyanova (Sofia, Bulgaria). . . . .	252
Vertically aligned TiO <sub>2</sub> nanorod arrays for electrochemical supercapacitor A. Ramadoss and S.J. Kim (Jeju, Republic of Korea). . . . .	262
Effect of pressure on structural, electronic and bonding properties of CaTM <sub>2</sub> Pn <sub>2</sub> (TM = Ni, Pd; Pn = P, As) compounds: A full potential computational study D.S. Jayalakshmi and M. Sundareswari (Chennai, India) . . . . .	268
The crystal structure of Ni-Zn co-doped β boron, Ni <sub>0.18</sub> Zn <sub>1.21</sub> B <sub>34.94</sub> Z. Malik, O. Sologub, G. Giester and P. Rogl (Vienna, Austria) . . . . .	276
Effect of Sn addition on the optical constants of Ge-Sb-S thin films based only on their measured reflectance spectra K.A. Aly and F.M. Abdel-Rahim (Saudi Arabia, Assiut, Egypt) . . . . .	284
Keywords. . . . .	III