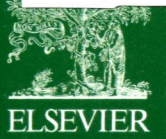


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# JOURNAL OF SOLID STATE CHEMISTRY

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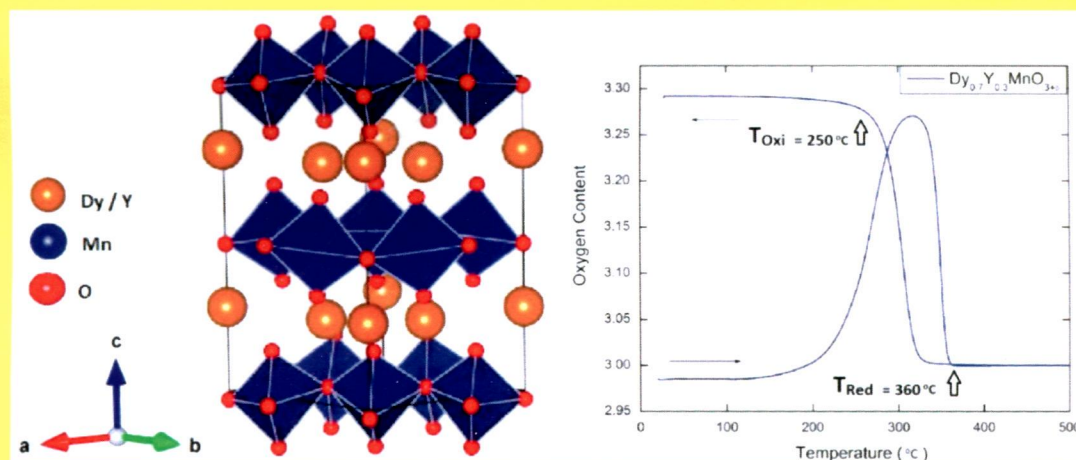
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IN THIS ISSUE:

**Structural, magnetic, and oxygen storage properties  
of hexagonal  $Dy_{1-x}Y_xMnO_{3+\delta}$**



**C. Abughayada, B. Dabrowski, M. Avdeev, S. Kolesnik,  
S. Remsen and O. Chmaissem**

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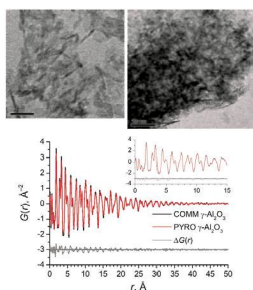
Abstracted/indexed in BioEngineering Abstracts, Chemical Abstracts, Coal Abstracts, Current Contents/Physics, Chemical, & Earth Sciences, Engineering Index, Research Alert, SCISEARCH, Science Abstracts, and Science Citation Index. Also covered in the abstract and citation database SCOPUS<sup>®</sup>. Full text available on ScienceDirect<sup>®</sup>.

### Regular Articles

#### Structural analysis of highly porous $\gamma$ -Al<sub>2</sub>O<sub>3</sub>

Louise Samain, Aleksander Jaworski, Mattias Edén, Danielle M. Ladd, Dong-Kyun Seo, F. Javier Garcia-Garcia and Ulrich Häussermann

page 1



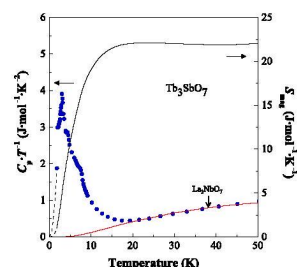
Boehmite-derived and sol-gel synthesized porous  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> possess identical structural properties, featuring a nm scale local structure and a tetragonal average structure.

### Regular Articles—Continued

#### High-temperature X-ray diffraction measurements of fluorite-related rare earth antimonates Ln<sub>3</sub>SbO<sub>7</sub> (Ln=Nd, Tb) and their magnetic properties

Yukio Hinatsu and Yoshihiro Doi

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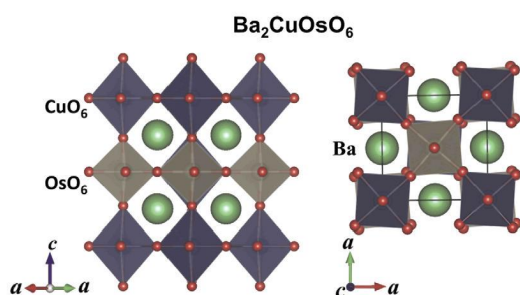


Temperature dependence of the specific heat divided by temperature ( $C_p/T$ ) and the magnetic entropy ( $S_{\text{mag}}$ ) for Tb<sub>3</sub>SbO<sub>7</sub>. Two-step magnetic transition has been observed.

#### High-pressure synthesis, crystal structure and magnetic properties of double perovskite oxide Ba<sub>2</sub>CuOsO<sub>6</sub>

Hai L. Feng, Masao Arai, Yoshitaka Matsushita, Yoshihiro Tsujimoto, Yahua Yuan, Clastin I. Sathish, Jianfeng He, Masahiko Tanaka and Kazunari Yamaura

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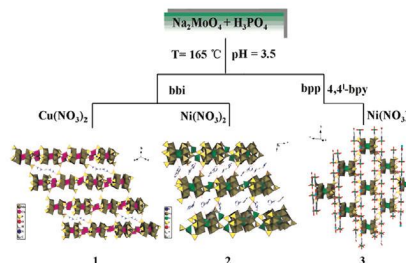


A new compositional double perovskite oxide Ba<sub>2</sub>CuOsO<sub>6</sub> synthesized by a high-pressure (6 GPa) and high-temperature (1500 °C) method.

#### Assembly of three organic–inorganic hybrid supramolecular materials based on reduced molybdenum (V) phosphates

He Zhang, Kai Yu, Jing-Hua Lv, Chun-Mei Wang, Chun-Xiao Wang and Bai-Bin Zhou

page 22



As new linking unit, Cu(H<sub>2</sub>O)<sub>3</sub>, Ni(H<sub>2</sub>O)<sub>2</sub>, and {Ni<sub>2</sub>(H<sub>2</sub>O)<sub>10</sub>Na(PCA)<sub>2</sub>} are introduced into {TM(P<sub>4</sub>Mo<sub>6</sub>)<sub>2</sub>} reaction systems to assemble three supramolecular materials under hydrothermal conditions via changing organic ligand and transition metal.

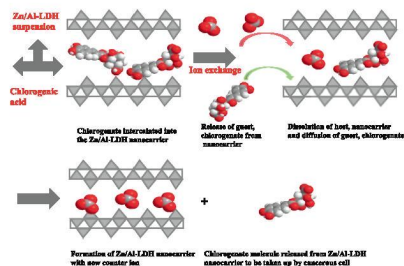
Continued



**Drug delivery system for an anticancer agent, chlorogenate-Zn/Al-layered double hydroxide nanohybrid synthesised using direct co-precipitation and ion exchange methods**

Farahnaz Barahuie, Mohd Zobir Hussein, Palanisamy Arulselvan, Sharida Fakurazi and Zulkarnain Zainal

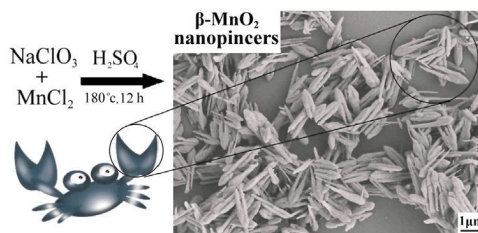
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**A facile one-pot hydrothermal synthesis of  $\beta$ -MnO<sub>2</sub> nanopincers and their catalytic degradation of methylene blue**

Gao Cheng, Lin Yu, Ting Lin, Runnong Yang, Ming Sun, Bang Lan, Lili Yang and Fangze Deng

page 57

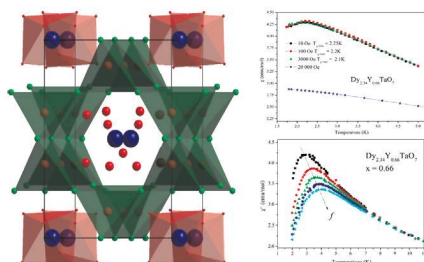


Branched  $\beta$ -MnO<sub>2</sub> bipods with novel nanopincer morphology were prepared by a facile one-pot hydrothermal method through oxidizing MnSO<sub>4</sub> with NaClO<sub>3</sub> in H<sub>2</sub>SO<sub>4</sub> condition without using any surfactants or templates.

**Spin glass behavior in the Dy<sub>3-x</sub>Y<sub>x</sub>TaO<sub>7</sub> (0 ≤ x ≤ 1) system**

J. Francisco Gomez-Garcia, Roberto Escudero and Gustavo Tavizon

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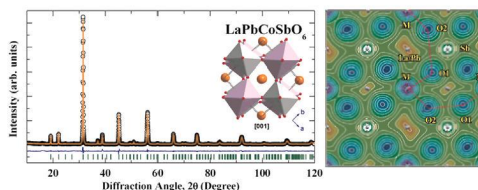


Weberite-type crystal structure of the Dy<sub>3-x</sub>Y<sub>x</sub>TaO<sub>7</sub> compounds. In this structure the magnetic sublattice is formed by Dy<sup>3+</sup> cations in an arrangement of distorted tetrahedra at the second-nearest neighbor site; this arrangement suggests geometric frustration that leads to a spin glass behavior

**Perovskite LaPbMSbO<sub>6</sub> (M=Co, Ni): Structural distortion, magnetic and dielectric properties**

Yijia Bai, Lin Han, Xiaojuan Liu, Xiaolong Deng, Xiaojie Wu, Chuangang Yao, Qingshuang Liang, Junling Meng and Jian Meng

page 64

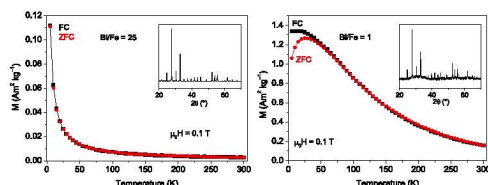


XRD Rietveld refinement result of LaPbCoSbO<sub>6</sub> presented a large BO<sub>6</sub> octahedral distortion along the *ab* plane. Based upon the variations from Co-O-Sb bond angles, a fierce competition from many extended magnetic coupling routes (*M-O-O-M*) would induce a considerably large magnetic frustration and electron hopping restriction.

**Investigations on Bi<sub>25</sub>FeO<sub>40</sub> powders synthesized by hydrothermal and combustion-like processes**

Roberto Köferstein, Toni Buttler and Stefan G. Ebbinghaus

page 50

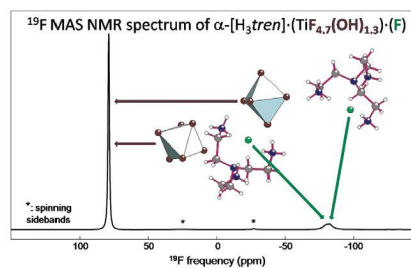


Bi<sub>25</sub>FeO<sub>40</sub> powders were prepared by a hydrothermal method and a combustion process. The optical band gaps and the peritectic point were determined. The magnetic behaviour was investigated depending on the synthesis and the initial Bi/Fe ratios. The influence of amorphous iron-oxide on the magnetic properties was examined.

**F<sup>-</sup>/OH<sup>-</sup> substitution in [H<sub>4</sub>tren]<sup>4+</sup> and [H<sub>3</sub>tren]<sup>3+</sup> hydroxyfluorotitanates(IV) and classification of tren cation configurations**

Jérôme Lhoste, Monique Body, Christophe Legein, Annie Ribaud, Marc Leblanc and Vincent Maisonneuve

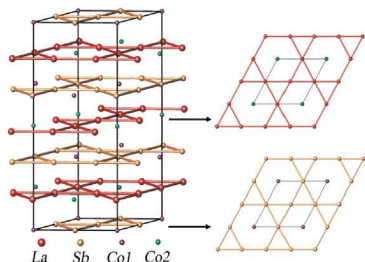
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The ratio of the relative intensities of the <sup>19</sup>F NMR lines assigned to F atoms belonging to isolated TiF<sub>6-x</sub>(OH)<sub>x</sub> octahedra and to “free” fluoride ions shows that the F<sup>-</sup>/OH<sup>-</sup> substitution concerns only F atoms bonded to titanium.

## Syntheses and properties of a family of new compounds $RE_3Sb_3Co_2O_{14}$ ( $RE=La, Pr, Nd, Sm-Ho$ ) with an ordered pyrochlore structure

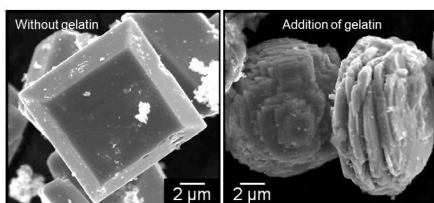
Kuo Li, Yufei Hu, Yingxia Wang, Takashi Kamiyama, Bingwu Wang, Zhaofei Li and Jianhua Lin  
page 80



$La_3Sb_3Co_2O_{14}$  crystallizes in a pyrochlore related structure with an ordered distribution of cations, giving rise to two sets of ideal 2D Kagome lattices formed by  $La^{3+}$  or  $Sb^{3+}$  respectively. This rhombohedral pyrochlore is a tolerant structure for stable compounds composed by many light rare-earth and *d*-transition elements. Substituting  $Zn^{2+}$  or  $Mg^{2+}$  for  $Co^{2+}$  will provide a series of compounds useful for studying magnetic interactions in the rare-earth Kagome lattices.

## Hydrothermal synthesis of nanostructured SnO particles through crystal growth in the presence of gelatin

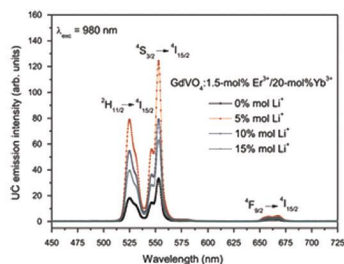
Hiroaki Uchiyama, Shunsuke Nakanishi and Hiromitsu Kozuka  
page 87



Nanostructured SnO particles were obtained from  $Sn_6O_4(OH)_4$  by the hydrothermal treatment in gelatin solutions.

## Enhancement of luminescence emission from $GdVO_4$ : $Er^{3+}/Yb^{3+}$ phosphor by $Li^+$ co-doping

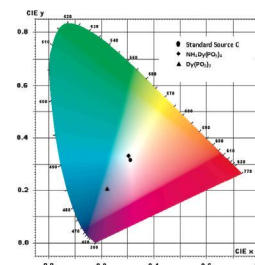
Tamara V. Gavrilović, Dragana J. Jovanović, Vesna M. Lojpur, Vesna Đorđević and Miroslav D. Dramićanin  
page 92



UC emission spectra for  $GdVO_4:1.5\text{-mol\% } Er^{3+}/20\text{-mol\% } Yb^{3+}$  powders co-doped with different concentrations of  $Li^+$  ions, recorded under 980-nm excitation.

## Synthesis, characterization and optical properties of $NH_4Dy(PO_3)_4$

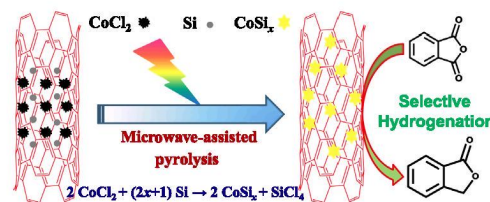
S. Chemingui, M. Ferhi, K. Horchani-Naifer and M. Férid  
page 99



The CIE color coordinate diagrams showing the chromatic coordinates of  $Dy^{3+}$  luminescence in  $NH_4Dy(PO_3)_4$  and  $Dy(PO_3)_3$ .

## Rapid microwaves synthesis of $CoSi_x/CNTs$ as novel catalytic materials for hydrogenation of phthalic anhydride

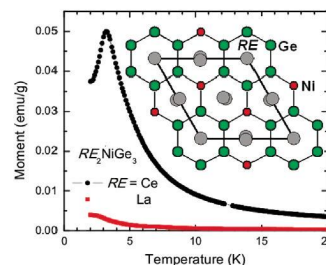
Liangliang Zhang, Xiao Chen, Shaohua Jin, Jingchao Guan, Christopher T. Williams, Zhijian Peng and Changhai Liang  
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$CoSi_x/CNTs$  catalysts with different  $CoSi_x$  phases ( $CoSi_2$ ,  $CoSi$ ) have been rapidly synthesized via microwave-assisted route, which involves the vaporization of  $CoCl_2$  and subsequent reaction of  $CoCl_2$  with Si.

## Neutron diffraction studies on structural and magnetic properties of $RE_2NiGe_3$ ( $RE=La, Ce$ )

Deepti Kalsi, S. Rayaprol, V. Siruguri and Sebastian C. Peter  
page 113



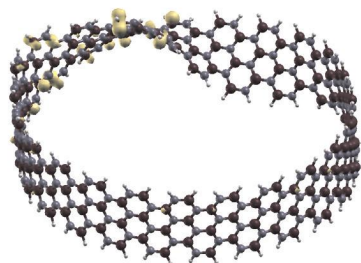
The compounds  $La_2NiGe_3$  and  $Ce_2NiGe_3$  crystallize in the  $Er_2RhSi_3$  type. Magnetic susceptibility show antiferromagnetic ordering for  $Ce_2NiGe_3$  at 3.2 K and neutron diffraction confirms the absence of long range ordering.

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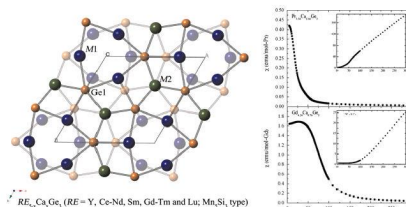
## Effect of an electric field on the properties of BN Möbius stripes

J. Lemos de Melo, S. Azevedo and J.R. Kaschny  
page 120



## Calcium substitution in rare-earth metal germanides with the hexagonal $Mn_5Si_3$ structure type. structural characterization of the extended series $RE_{5-x}Ca_xGe_3$ ( $RE$ =Rare-earth metal)

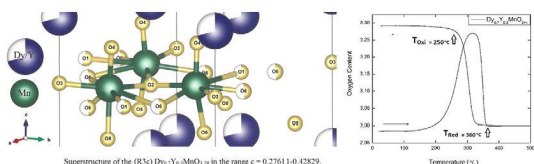
Nian-Tzu Suen, Matthew Broda and Svilen Bobev  
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The family of rare-earth metal–calcium–germanides with the general formula  $RE_{5-x}Ca_xGe_3$  ( $RE=Y, Ce-Nd, Sm, Gd-Tm$  and  $Lu$ ;  $Mn, Si$ , type) crystallize in the hexagonal space group  $P6_3/mcm$  (No. 193, Pearson symbol  $hP16$ ) with a structure that is a variant of the  $Mn_5Si_3$  structure type.

## Structural, magnetic, and oxygen storage properties of hexagonal $Dy_{1-x}Y_xMnO_{3+\delta}$

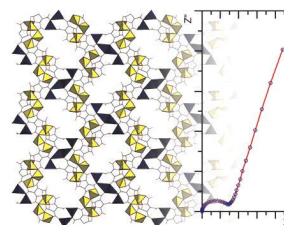
C. Abughayada, B. Dabrowski, M. Avdeev, S. Kolesnik, S. Remsen and O. Chmaissem  
page 127



Superstructure of the ( $R3c$ )  $Dy_{0.7}Y_{0.3}MnO_{3.29}$  in the lattice range  $c=0.27611-0.42829$  (left panel) along with its low-temperature oxygen absorption/desorption capability in pure  $O_2$  (right panel).

## New MOF based on lithium tetrahydrofuran-2,3,4,5-tetracarboxylate: Its structure and conductivity behavior

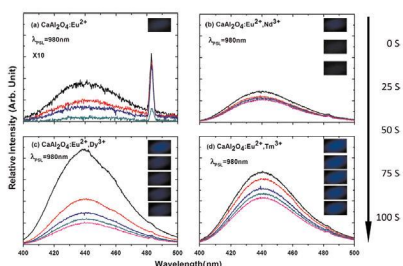
Vitezslav Zima, Deepak S. Patil, Duraisamy Senthil Raja, Ting-Guang Chang, Chia-Her Lin, Koichi Shimakawa and Tomas Wagner  
page 150



Structure of a new metal organic framework was determined and its ionic conductivity was evaluated using a random-walk approach.

## Long persistent and optically stimulated luminescence behaviors of calcium aluminates with different trap filling processes

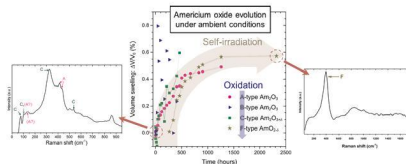
Buhao Zhang, Xuhui Xu, Qian Yue Li, Yumei Wu, Jianbei Qiu and Xue Yu  
page 136



OSL emission spectra of  $Ca_{0.995}Al_2O_4:0.0025Eu^{2+}, 0.0025R^{3+}$  ( $R=Nd, Dy, Tm$ ) taken under varying stimulation time (0, 25, 50, 75, 100 s). Inset: Blue emission pictures under varying stimulation time.

## Self-irradiation and oxidation effects on americium sesquioxide and Raman spectroscopy studies of americium oxides

Denis Horlait, Richard Caraballo, Florent Lebreton, Christophe Jégou, Pascal Roussel and Thibaud Delahaye  
page 159

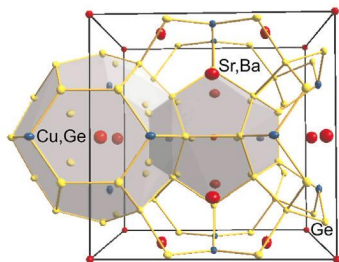


The evolution of americium oxide under ambient conditions was monitored using XRD (X-ray diffraction) and Raman spectroscopy. After a thermal treatment under reducing conditions, a polyphasic sample mainly composed of A- and C-type americium sesquioxides is evidenced by XRD and Raman spectroscopy. The sample then evolves through two processes: oxidation and self-irradiation. The first one provokes the progressive appearance of F-type americium dioxide while the initial phases disappear, whereas the main effect of the second is a structural swelling with time.

## Clathrate formation in the systems Sr–Cu–Ge and {Ba,Sr}–Cu–Ge

I. Zeiringer, R. Moser, F. Kneidinger, R. Podloucky, E. Royanian, A. Grytsiv, E. Bauer, G. Giester, M. Falmbigl and P. Rogl

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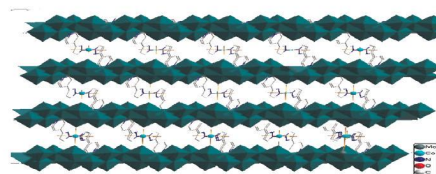


Clathrate type-I unit cell including the coordination polyhedra for the Sr (or Ba) atoms.

## The structures and properties of the new two-dimensional inorganic–organic hybrid materials based on the molybdate chains

Na Li, Bao Mu, Xinyu Cao and Rudan Huang

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In complex **1**, The Co ion is six coordinated by four oxygen atoms from two Mo<sub>6</sub>O<sub>20</sub> and two water molecules, and two N atoms from two different ligand. It is noticeable that there is an one-dimensional chain molybdate, which is combined by O–Mo–O, then the chain parallel with each other, the Mo<sub>6</sub> anion acts as a bidentate ligand providing O7 atoms to bridge CoII ions to form a 2D inorganic layer. Finally every nets become 3D structure by hydrogen bond.

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