

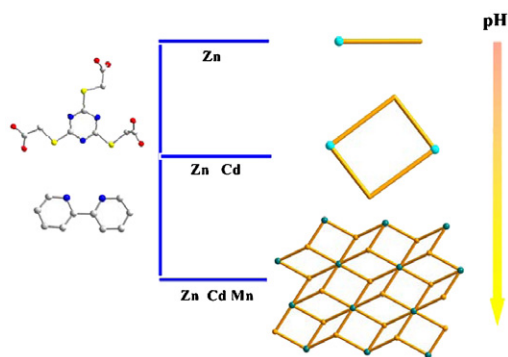
CONTENTS

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Regular Articles

**pH- and metal-dependent structural diversity from mononuclear to two-dimensional polymers based on a flexible tricarboxylate ligand**

Chengjuan Li, Yanqiang Peng, Suna Wang, Xianxi Zhang, Yizhi Li, Jianmin Dou and Dacheng Li  
page 1581

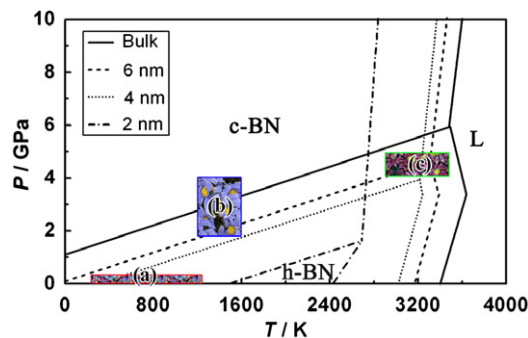


Six complexes based on a flexible tricarboxylate ligand exhibit rich structural chemistry from mononuclear to 2D (3,6)-connected networks. PH and metal ions have large influences on the resulting structures.

Regular Articles—Continued

**Prediction of formation of cubic boron nitride by construction of temperature–pressure phase diagram at the nanoscale**

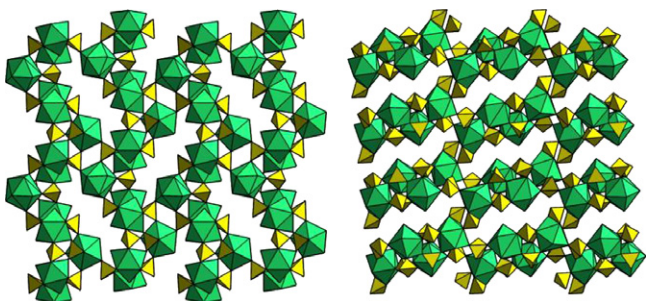
Shengliang Hu, Jinlong Yang, Wei Liu, Yingge Dong, Shirui Cao and Jun Liu  
page 1598



The size-dependent phase diagram of BN was developed on the basis of nanothermodynamic theory and it can be used to predict whether cubic BN (c-BN) can be formed at a given condition.

**The crystal chemistry of four thorium sulfates**

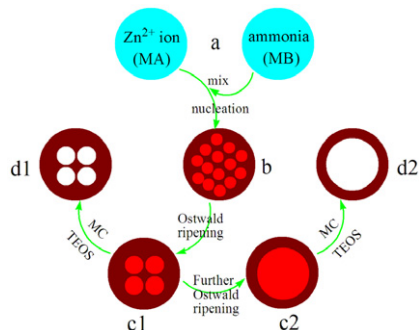
Amanda J. Albrecht, Ginger E. Sigmon, Laura Moore-Shay, Rebecca Wei, Colleen Dawes, Jennifer Szymanowski and Peter C. Burns  
page 1591



The structures of four hydrous thorium sulfates are reported that have structural units consisting of finite clusters, chains, and frameworks.

**SiO<sub>2</sub> nanospheres with tailorable interiors by directly controlling Zn<sup>2+</sup> and NH<sub>3</sub>·H<sub>2</sub>O species in an emulsion process**

Yuchao Liao, Xiaofeng Wu, Zhen Wang and Yun-Fa Chen  
page 1603

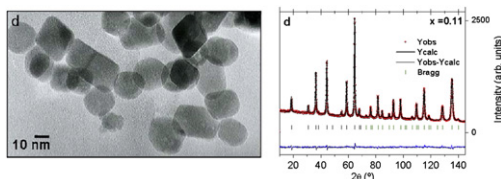


Formation process of SiO<sub>2</sub> nanospheres with porous and single hollow interior.

## Neutron diffraction study and superparamagnetic behavior of $ZnFe_2O_4$ nanoparticles obtained with different conditions

V. Blanco-Gutierrez, E. Climent-Pascual, M.J. Torralvo-Fernandez, R. Saez-Puche and M.T. Fernandez-Diaz

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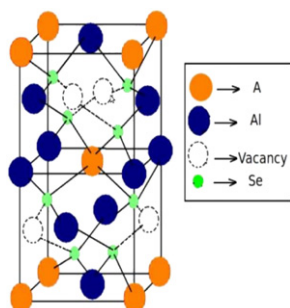


$ZnFe_2O_4$  nanoparticles of 19 nm obtained by the solvothermal method together with its Rietveld refined pattern.

## Electronic and structural properties of $A Al_2Se_4$ ( $A = Ag, Cu, Cd, Zn$ ) chalcopyrite semiconductors

S. Mishra and B. Ganguli

page 1614

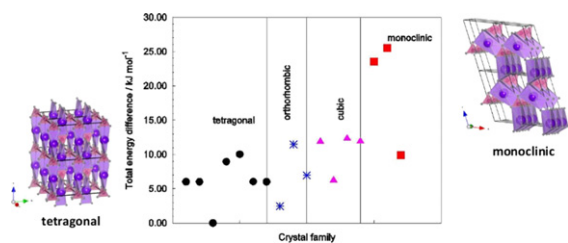


Band structure and TDOS show the band gaps and effect of structural distortion on electronic properties. PDOS shows effect of  $p-d$  hybridization on band gaps for all four compounds.

## Ab-initio crystal structure prediction. A case study: $NaBH_4$

Riccarda Caputo and Adem Tekin

page 1622

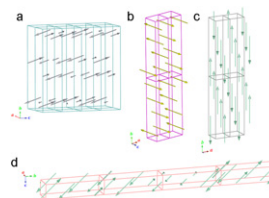


The total electron energy difference of the calculated stable structures. Here, the tetragonal (IT 137) and the monoclinic (IT 6) symmetry groups corresponded to the lowest and the highest energy structures, respectively.

## Neutron diffraction studies of $RSn_{1+x}Ge_{1-x}$ ( $R = Tb-Er$ ) compounds

A. Gil, B. Penc, S. Baran, A. Hoser and A. Szytuła

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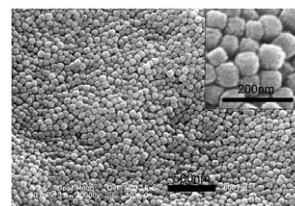


The magnetic structures of  $RSn_{1+x}Ge_{1-x}$  ( $R = Tb, Dy, Ho$  and  $Er, x \approx 0.1$ ) compounds have been determined by neutron diffraction studies on polycrystalline samples. The magnetic ordering in  $TbSn_{1.12}Ge_{0.88}$  (a) is sine-modulated described by the propagation vector  $\mathbf{k} = (0.426, 0, 0.588)$ . The magnetic structures of  $RSn_{1+x}Ge_{1-x}$  where  $R$  are  $Dy$  (b),  $Ho$  (c) and  $Er$  (c) at temperatures close to 1.5 K are described by the propagation vector  $\mathbf{k} = (1/2, 1/2, 0)$  with the sequence  $(+ + - +)$  of magnetic moments in the crystal cell. For  $Ho$ - and  $Dy$ -compound this ordering is stable up to  $T_N$  while for  $Er$ -compound at  $T_1 = 3.5$  K it tunes into a modulated structure (d).

## Facile synthesis of $Cu_2O$ nanocube/polycarbazole composites and their high visible-light photocatalytic properties

Wei Sun, Wendong Sun, Yujiang Zhuo and Ying Chu

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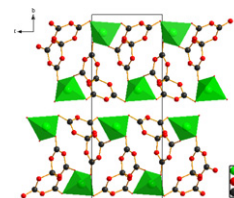


The uniform and monodisperse  $Cu_2O$  nanocube/polycarbazole composites were prepared by an one-pot solvothermal process. As covered by polycarbazole, the photocatalytic activities of  $Cu_2O$  nanocubes were improved. The polycarbazole not only protected and stabilized  $Cu_2O$  cubes, but also prohibited the recombination of photogenerated electrons–holes pair and facilitated interfacial charge transfer between polycarbazole and  $Cu_2O$ .

## Synthesis, structure characterization and optical properties of a new tripotassium cadmium pentaborate, $K_3CdB_5O_{10}$

Hongwei Yu, Shilie Pan, Hongping Wu, Jian Han, Xiaoyu Dong and Zhongxiang Zhou

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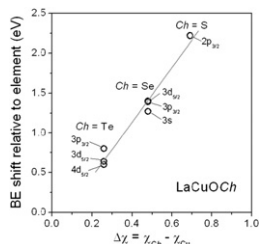


A new phase,  $K_3CdB_5O_{10}$ , has been discovered in the ternary  $K_2O-CdO-B_2O_3$  system. The crystal structure consists of a two-dimensional infinite  $[CdB_5O_{10}]$  layer.

Continued

**Electronic structure of lanthanum copper oxychalcogenides  $\text{LaCuOCh}$  ( $\text{Ch}=\text{S}, \text{Se}, \text{Te}$ ) by X-ray photoelectron and absorption spectroscopy**

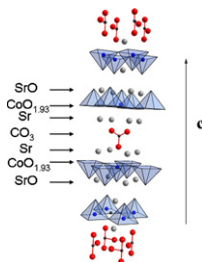
Brent W. Rudyk, Peter E.R. Blanchard, Ronald G. Cavell and Arthur Mar  
page 1649



The presence of anionic chalcogen atoms in  $\text{LaCuOCh}$  is supported by the  $\text{Ch}$  binding energies, which undergo negative shifts proportional to the polarity of the  $\text{Cu}-\text{Ch}$  bonds.

**The ability of RP-type cobaltites to accommodate carbonate groups: A new layered oxide  $\text{Sr}_4\text{Co}_2(\text{CO}_3)\text{O}_{5.86}$**

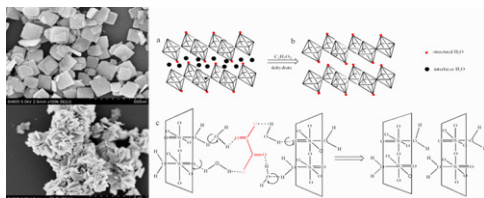
A. Demont, D. Pelloquin, S. Hébert, Y. Bréard, J. Höwing, Y. Miyazaki and A. Maignan  
page 1655



Structural model of the  $\text{Sr}_4\text{Co}_2(\text{CO}_3)\text{O}_{5.86}$  oxycarbonate.

**Oxalic acid mediated synthesis of  $\text{WO}_3 \cdot \text{H}_2\text{O}$  nanoplates and self-assembled nanoflowers under mild conditions**

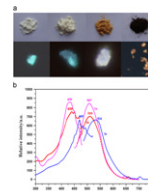
Linzhi Li, Jingzhe Zhao, Yi Wang, Yunling Li, Dechong Ma, Yan Zhao, Shengnan Hou and Xinli Hao  
page 1661



The oxalic acid has a key role for the structure of  $\text{WO}_3 \cdot \text{H}_2\text{O}$  evolution from plates to flowers and the dehydration process of  $\text{WO}_3 \cdot 2\text{H}_2\text{O}$  to  $\text{WO}_3 \cdot \text{H}_2\text{O}$ .

**Synthesis and structure of  $[\text{C}_6\text{N}_4\text{H}_{20}]_{0.5}[\text{B}_5\text{O}_6(\text{OH})_4]$ : A new organically templated pentaborate with white-light-emission**

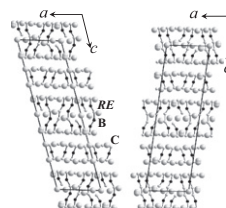
Yang Yang, Jiang-Bo Sun, Miao Cui, Rui-Bin Liu, Yu Wang and Chang-Gong Meng  
page 1666



A green–blue luminescence occurs with an emission maximum at 507 nm upon excitation at 430 nm. The photoluminescence of **1a** can be modified from green–blue to white by means of a simple heat-treatment process.

**New members of ternary rare-earth metal boride carbides containing finite boron–carbon chains:  $\text{RE}_{25}\text{B}_{14}\text{C}_{26}$  ( $\text{RE}=\text{Pr}, \text{Nd}$ ) and  $\text{Nd}_{25}\text{B}_{12}\text{C}_{28}$**

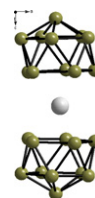
Volodymyr Babizhetskyy, Hansjürgen Mattausch, Arndt Simon, Régis Gautier and Jean-François Halet  
page 1671



New ternary rare-earth metal boride carbides  $\text{RE}_{25}\text{B}_{14}\text{C}_{26}$  ( $\text{RE}=\text{Pr}, \text{Nd}$ ) and  $\text{Nd}_{25}\text{B}_{12}\text{C}_{28}$  were synthesized by co-melting the elements.  $\text{Nd}_{25}\text{B}_{12}\text{C}_{28}$  is stable up to 1440 K.  $\text{RE}_{25}\text{B}_{14}\text{C}_{26}$  ( $\text{RE}=\text{Pr}, \text{Nd}$ ) exist above 1270 K. The crystal structures were investigated by means of single-crystal X-ray diffraction. Their structures consist of a three-dimensional framework of rare-earth metal atoms resulting from the stacking of slightly corrugated and distorted square nets, leading to cavities filled with cumulene-like molecules  $[\text{B}_2\text{C}_4]^{6-}$  and  $[\text{B}_3\text{C}_3]^{7-}$ , nearly linear  $[\text{BC}_2]^{5-}$  and bent  $[\text{BC}_2]^{7-}$  units and isolated carbon atoms, respectively. Structural and theoretical analysis suggests the ionic formulation for  $\text{RE}_{25}\text{B}_{14}\text{C}_{26}$ :  $(\text{RE}^{3+})_{25}[\text{B}_2\text{C}_4]^{6-}([\text{B}_3\text{C}_3]^{7-})_2([\text{BC}_2]^{5-})_4([\text{BC}_2]^{7-})_2(\text{C}^{4-})_4 \cdot 5e^-$  and for  $\text{Nd}_{25}\text{B}_{12}\text{C}_{28}$ :  $(\text{Nd}^{3+})_{25}([\text{B}_2\text{C}_4]^{6-})_3([\text{BC}_2]^{7-})_4([\text{BC}_2]^{7-})_2(\text{C}^{4-})_4 \cdot 7e^-$ .

**Effect of transition element doping on crystal structure of rare earth borosilicides  $\text{REB}_{44}\text{Si}_2$**

D. Berthebaud, A. Sato, Y. Michiue, T. Mori, A. Nomura, T. Shishido and K. Nakajima  
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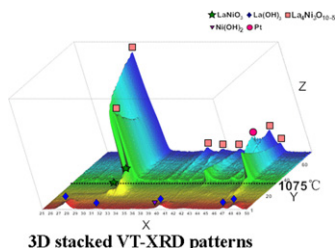


New transition elements doped  $\text{YB}_{44}\text{Si}_2$  were synthesized and have nominal compositions  $\text{YB}_{41.1}\text{Si}_{1.1}\text{Rh}_{0.02}$  and  $\text{YB}_{41}\text{Si}_{1.3}\text{Ni}_{0.06}$ . Insertion of transition elements into the crystal structure of  $\text{YB}_{44}\text{Si}_2$  leads to the transformation of  $\text{B}_{12}$  icosahedra into  $\text{B}_{11}$  polyhedrons for a few percent of them.

**In situ variable temperature X-ray diffraction studies on the transformations of nano-precursors to La–Ni–O phases**

Xiaole Weng, Jonathan C. Knowles, Isaac Abrahams, Zhongbiao Wu and Jawwad A. Darr

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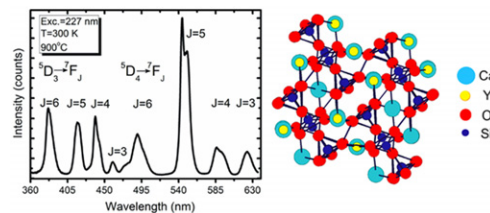


*In situ* variable temperature XRD showing the phase formation pathway of  $\text{La}_{n+1}\text{Ni}_n\text{O}_{3n+1}$  at evaluated temperatures.

**Luminescence of Tb-doped  $\text{Ca}_3\text{Y}_2(\text{Si}_3\text{O}_9)_2$  oxide upon UV and VUV synchrotron radiation excitation**

Anna Dobrowolska and Eugeniusz Zych

page 1707

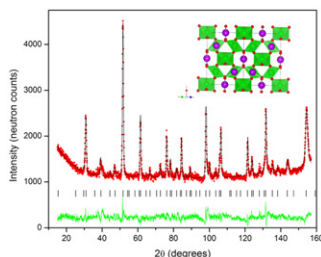


Luminescence of  $\text{Ca}_3\text{Y}_2(\text{Si}_3\text{O}_9)_2:\text{Tb}$  covers the whole visible region of electromagnetic spectrum and the relative intensity of the blue part against the green one depends on the activator content and technological parameters of preparation.

**Neutron diffraction studies of  $\text{Gd}_2\text{Zr}_2\text{O}_7$  pyrochlore**

Brendan J. Kennedy, Qingdi Zhou and Maxim Avdeev

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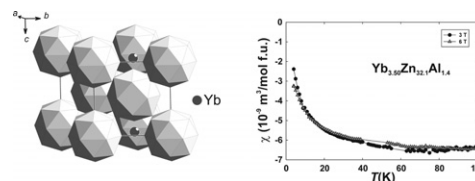


$\text{Gd}_2\text{Zr}_2\text{O}_7$  enriched in  $^{160}\text{Gd}$  prepared. Neutron diffraction reveals ordering of the anions. Precise structure established.

**$\text{SmZn}_{11}$ -type derivative compound in the Yb–Zn–Al system: Crystal structure and magnetic properties**

O. Stelmakhovych, B. Stelmakhovych, K. Uhlířová, S. Mašková, L. Havela and Ya. Kalychak

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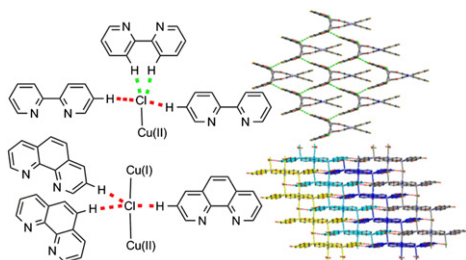


Crystal structure and magnetic susceptibility of  $\text{Yb}_{3.50}\text{Zn}_{32.1}\text{Al}_{1.4}$ .

**C–H...Cl relevant discrepancy on structure, magnetic and electronic conductivity of two mixed-valence  $\text{Cu}^{\text{I}}\text{Cu}^{\text{II}}$  coordination polymers**

Ling Shi, Ping Yang, Guang Huang, Qian Li, Ning Wang, Jian-Zhong Wu and Ying Yu

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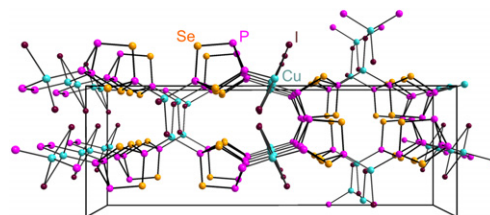


Subtly different C–H...Cl bonding nature leads to diverse coordination modes and supramolecular networks, as well as physical properties of two  $\text{Cu}^{\text{I}}\text{Cu}^{\text{II}}$  coordination polymers with similar compositions.

**Structures, spectroscopic studies and solid-state thermal transformations of coordination polymers from  $\text{P}_4\text{Se}_3$  and  $\text{CuX}$  ( $\text{X} = \text{Cl}, \text{Br}, \text{I}$ )**

Andreas Biegerl, Christian Gröger, Hans R. Kalbitzer, Arno Pfitzner, Joachim Wachter, Richard Weihrich and Manfred Zabel

page 1719

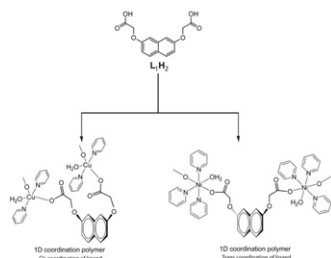


New coordination polymers have been prepared and characterized by the reaction of  $\text{P}_4\text{Se}_3$  and copper(I) halides solutions under diffusion conditions.

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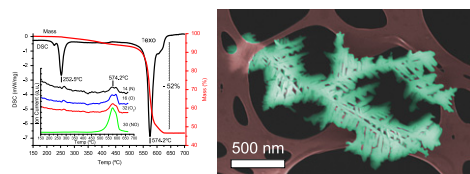


**Different geometrical arrangements in carboxylate coordination polymers of flexible dicarboxylic acid**  
 Himangshu Deka, Rupam Sarma, Satchi Kumari, Alika Khare and Jubaraj B. Baruah  
 page 1726



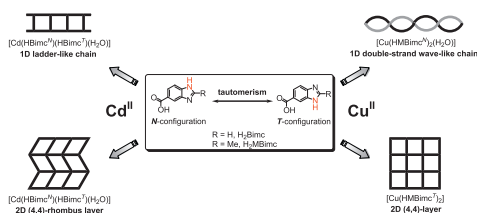
Different geometrical arrangements in coordination polymers derived from (7-carboxymethoxy-naphthalen-2-yloxy)-acetic acid of metal ions Mn(II), Ni(II), Cu(II), Zn(II) and Cd(II) are presented. The (5-carboxymethoxy-naphthalen-1-yloxy)-acetic acid led to hexa-aquo cadmium(II) dicarboxylate.

**Growth of single crystalline dendritic Li<sub>2</sub>SiO<sub>3</sub> arrays from LiNO<sub>3</sub> and mesoporous SiO<sub>2</sub>**  
 José M. Córdoba, Mohamed A. Ballem, Emma M. Johansson and Magnus Odén  
 page 1735



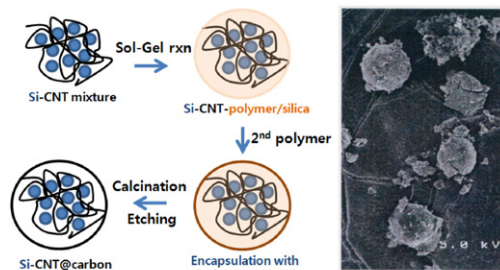
TG/DSC and gas analysis (inset) curves of the synthesis reaction measured in air and SEM micrograph of the Li<sub>2</sub>SiO<sub>3</sub> dendrite obtained.

**Rare configuration of tautomeric benzimidazolecarboxylate ligands in cadmium(II) and copper(II) coordination polymers**  
 Jing-Yun Wu, Ciao-Wei Yang, Hui-Fang Chen, Yu-Chen Jao, Sheng-Ming Huang, Chitang Tsai, Tien-Wen Tseng, Gene-Hsiang Lee, Shie-Ming Peng and Kuang-Lieh Lu  
 page 1740



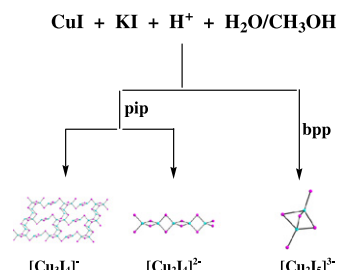
A pair of tautomeric HBimc building blocks (normal (N) and tautomer (T)) is found simultaneously in two Cd(II) networks, whereas, the normal and tautomer modes of HMBimc are present as separate entities in two Cu(II) frameworks. The isolation of a Cu(II) network with only a tautomer (T) mode of the benzimidazolecarboxylate-based ligand is achieved for the first time.

**Fabrication of carbon microcapsules containing silicon nanoparticles–carbon nanotubes nanocomposite by sol–gel method for anode in lithium ion battery**  
 Joonwon Bae  
 page 1749



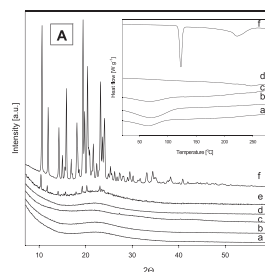
Carbon microcapsules containing silicon nanoparticles (Si NPs)–carbon nanotubes (CNTs) nanocomposite (Si-CNT@C) have been fabricated by a surfactant mediated sol–gel method.

**New organically templated photoluminescence iodocuprates(I)**  
 Qin Hou, Jin-Jing Zhao, Tian-Qi Zhao, Juan Jin, Jie-Hui Yu and Ji-Qing Xu  
 page 1756



The solvothermal self-assemblies of CuI, KI and pip/bpp in acidic CH<sub>3</sub>OH solutions created three iodocuprates 2-D layered [(Hpip)-Cu<sub>3</sub>I<sub>4</sub>] 1, 1-D chained [tmpip][Cu<sub>2</sub>I<sub>4</sub>] 2 and dinuclear [H<sub>2</sub>bpp]<sub>2</sub>[Cu<sub>2</sub>I<sub>5</sub>] I · 2H<sub>2</sub>O 3.

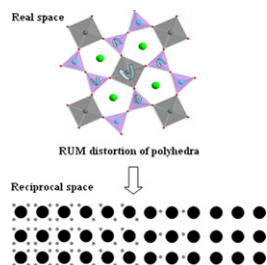
**Modified SBA-15 as the carrier for metoprolol and papaverine: Adsorption and release study**  
 Michał Moritz and Marek Łaniecki  
 page 1761



XRD and DSC of the –SO<sub>3</sub>H modified SBA-15 loaded with metoprolol.

## Microstructural features and domain formation in $(\text{Ba,Sr})_2\text{TiSi}_2\text{O}_8$ fresnoites

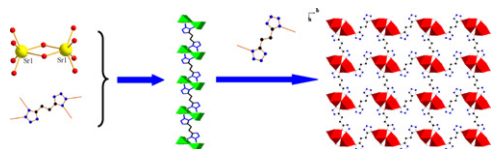
Chui Ling Wong, Cristiano Ferraris and T.J. White  
page 1768



Fresnoite layers contain  $\text{SiO}_4$  and  $\text{TiO}_5$  polyhedra that undergo run rotation and tilting to create 3D, 4D and 5D structural modulations that can be directly observed by electron diffraction and high resolution imaging.

## Syntheses and characterization of energetic compounds constructed from alkaline earth metal cations (Sr and Ba) and 1,2-bis(tetrazol-5-yl)ethane

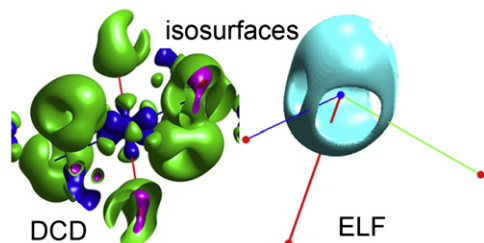
Zhengqiang Xia, Sanping Chen, Qing Wei and Chengfang Qiao  
page 1777



Two novel 2D isomorphous alkaline earth metal complexes were assembled by 4-connected  $\text{Sr}_2(\text{H}_2\text{O})_{10}/\text{Ba}_2(\text{H}_2\text{O})_{10}$  SBUs and two independent binding modes of  $\text{H}_2\text{BTE}$  ligands, and the catalytic performances toward thermal decomposition of ammonium perchlorate and photoluminescent properties of them were investigated.

## First-principle investigation of Jahn–Teller distortion and topological analysis of chemical bonds in $\text{LiNiO}_2$

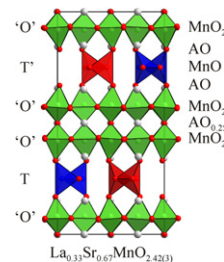
Zhenlian Chen, Huamin Zou, Xiaopeng Zhu, Jie Zou and Jiefeng Cao  
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Isosurfaces of the difference charge density and the electron localization function for the zigzag structure of  $\text{LiNiO}_2$ .

## The synthesis and complex anion-vacancy ordered structure of $\text{La}_{0.33}\text{Sr}_{0.67}\text{MnO}_{2.42}$

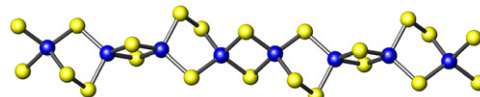
Edward Dixon, Joke Hadermann and Michael A. Hayward  
page 1791



The topotactic reduction of the perovskite phase  $\text{La}_{0.33}\text{Sr}_{0.67}\text{MnO}_3$  with  $\text{NaH}$  yields  $\text{La}_{0.33}\text{Sr}_{0.67}\text{MnO}_{2.42(3)}$ , which adopts a novel anion vacancy ordered structure with a 6-layer OOTOOT' stacking sequence of the 'octahedral' and tetrahedral layers. The anion site that links the neighbouring octahedral layers is partially occupied so only 25% of the 'octahedral' manganese sites actually have 6-fold  $\text{MnO}_6$  coordination.

## Hydrothermal synthesis of $[\text{C}_6\text{H}_{16}\text{N}_2][\text{In}_2\text{Se}_3(\text{Se}_2)]$ : A new one-dimensional indium selenide

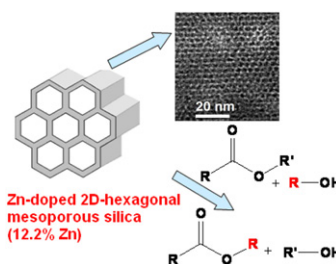
Sarah J. Ewing, Anthony V. Powell and Paz Vaquero  
page 1800



$[\text{C}_6\text{H}_{16}\text{N}_2][\text{In}_2\text{Se}_3(\text{Se}_2)]$ , prepared under hydrothermal conditions, contains one-dimensional chains of stoichiometry  $[\text{In}_2\text{Se}_3(\text{Se}_2)]^{2-}$ , in which four-membered  $[\text{In}_2\text{Se}_2]$  and five-membered  $[\text{In}_2\text{Se}_3]$  rings alternate.

## Highly ordered Zn-doped mesoporous silica: An efficient catalyst for transesterification reaction

Nabanita Pal, Manidipa Paul and Asim Bhaumik  
page 1805

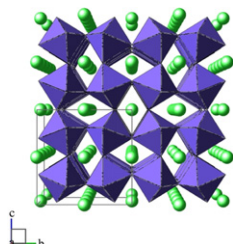


Zn-rich 2D-hexagonal mesoporous materials are synthesized hydrothermally, which show very good catalytic activity in the transesterification reaction under mild liquid phase reaction conditions.

Continued

**Synthesis, structure and electrical properties of  $\text{Cu}_{3.21}\text{Ti}_{1.16}\text{Nb}_{2.63}\text{O}_{12}$  and the  $\text{CuO}_x\text{-TiO}_2\text{-Nb}_2\text{O}_5$  pseudoternary phase diagram**

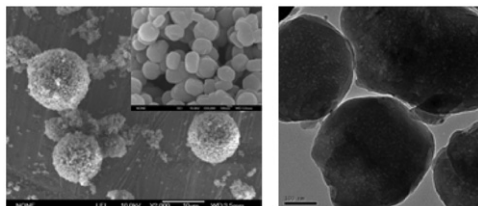
Nik Reeves-McLaren, Matthew C. Ferrarelli, Yuan-Wei Tung, Derek C. Sinclair and Anthony R. West  
page 1813



The  $\text{CuO}_x\text{-TiO}_2\text{-Nb}_2\text{O}_5$  phase diagram was determined at 935 °C and contains one new phase,  $\text{Cu}_{3.21}\text{Ti}_{1.16}\text{Nb}_{2.63}\text{O}_{12}$ , pictured, a modest semiconductor with  $\epsilon_r \sim 63$ , and one rutile-structured solid solution series,  $\text{Ti}_{1-3x}\text{Cu}_x\text{Nb}_{2x}\text{O}_2$ .

**Synthesis of mesoporous zeolite single crystals with cheap porogens**

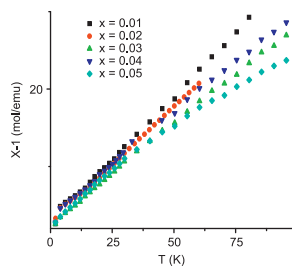
Haixiang Tao, Changlin Li, Jiawen Ren, Yanqin Wang and Guanzhong Lu  
page 1820



Mesoporous zeolite single crystals were synthesized by using cheap porogens as template.

**An X-ray diffraction, magnetic susceptibility and spectroscopic studies of  $\text{Yb}_{2-x}\text{Cr}_x\text{O}_3$**

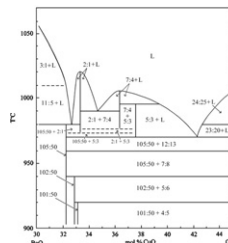
S. Hamdi, M. Amami, E.K. Hlil and R. Ben Hassen  
page 1828



The least square fit to the modified Curie–Weiss law shows paramagnetic interaction in  $\text{Yb}_{2-x}\text{Cr}_x\text{O}_3$  ( $0 < x \leq 0.03$ ). The  $\text{YbCrO}_3$  phase impurity will have no influence on the magnetic properties of the samples with  $x > 0.03$

**Phase relations in a barium-rich high-temperature region (25–45 mol% CuO, 900–1100 °C) of the BaO–CuO<sub>x</sub> system**

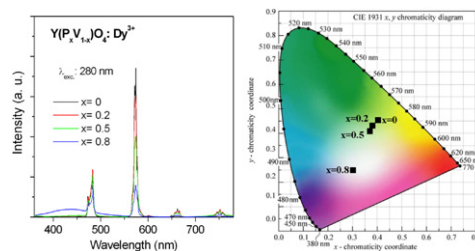
L.A. Klinkova, V.I. Nikolaichik, N.V. Barkovskii and V.K. Fedotov  
page 1834



A diagram of phase relations in the  $\text{BaO-CuO}_x$  system in the range of 30.0–45.0 mol% CuO at 900–1050 °C at  $P(\text{O}_2) = 21$  kPa (air) constructed on the data obtained by visual polythermal analysis (the liquidus line), XRD and ED with elemental analysis.

**$\text{Y}(\text{P,V})\text{O}_4:\text{Dy}^{3+}$  phosphors for white light generation: Emission dynamics and host effect**

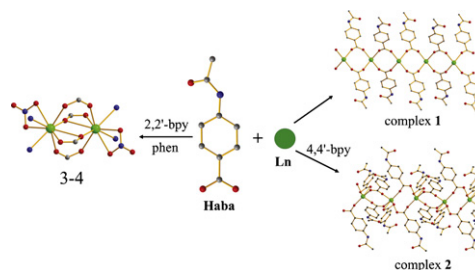
Fabio Angiuli, Francesco Mezzadri and Enrico Cavalli  
page 1843



The relative intensities of the emission features and the color of the luminescence vary with the host composition along the  $\text{Y}(\text{P}_x\text{V}_{1-x})\text{O}_4:\text{Dy}^{3+}$  system.

**Luminescent lanthanide complexes with 4-acetamidobenzoate: Synthesis, supramolecular assembly via hydrogen bonds, crystal structures and photoluminescence**

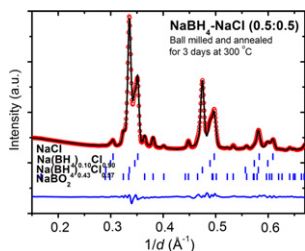
Xia Yin, Jun Fan, Zhi Hong Wang, Sheng Run Zheng, Jing Bo Tan and Wei Guang Zhang  
page 1850



Structure variation of four complexes is attributed to the change of coligands and various coordination modes of aba molecules. Moreover, they show characteristic emissions in the visible region.

### Chloride substitution in sodium borohydride

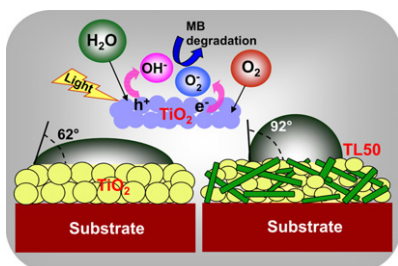
Dorthe B. Ravnsbæk, Line H. Rude and Torben R. Jensen  
page 1858



Dissolution of sodium chloride and sodium borohydride into each other resulting in formation of solid solutions of composition  $\text{Na}(\text{BH}_4)_{1-x}\text{Cl}_x$  is studied. Dissolution is facilitated by two methods: ball milling or annealing at 300 °C for three days of  $\text{NaBH}_4$ - $\text{NaCl}$  samples. Sample compositions and dissolution mechanism are studied by Rietveld refinement of synchrotron radiation powder X-ray diffraction data.

### Titania-lanthanum phosphate photoactive and hydrophobic new generation catalyst

Chembolli K. Jyothi, Kanakkanmavudi B. Jaimy, Swapankumar Ghosh, Sasidharan Sankar, V.S. Smitha and K.G.K. Warriar  
page 1867



Multifunctional  $\text{TiO}_2$ - $\text{LaPO}_4$  composite stabilizes anatase phase with enhanced photocatalytic activity, and moderately higher hydrophobicity is a promising material for self-cleaning application.

### Flux growth of a new cobalt-zinc-tin ternary phase $\text{Co}_{7+x}\text{Zn}_{3-x}\text{Sn}_8$ and its relationship to $\text{CoSn}$

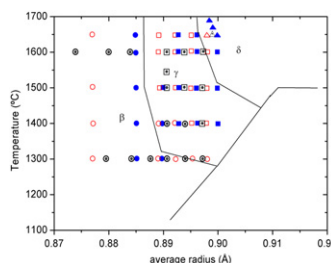
Patricia C. Reynolds, Milorad Stojanovic and Susan E. Latturmer  
page 1875



$\text{Co}_{7+x}\text{Zn}_{3-x}\text{Sn}_8$  forms from the reaction of cobalt in zinc/tin eutectic flux; it exhibits a  $Cmcm$  subcell or  $Pnma$  supercell depending on reactant stoichiometry.

### Solid solubility of $\text{Yb}_2\text{Si}_2\text{O}_7$ in $\beta$ -, $\gamma$ - and $\delta$ - $\text{Y}_2\text{Si}_2\text{O}_7$

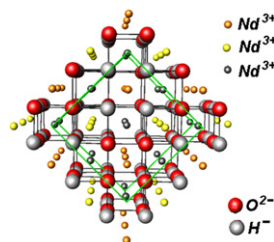
A.J. Fernández-Carrión, M.D. Alba, A. Escudero and A.I. Becerro  
page 1882



Polymorphism, as a function of average radii, in the systems  $\text{Yb}_2\text{Si}_2\text{O}_7$ - $\text{Y}_2\text{Si}_2\text{O}_7$  (dotted symbols),  $\text{Lu}_2\text{Si}_2\text{O}_7$ - $\text{Y}_2\text{Si}_2\text{O}_7$  (solid symbols) and  $\text{Sc}_2\text{Si}_2\text{O}_7$ - $\text{Y}_2\text{Si}_2\text{O}_7$  (open symbols) compared to phase boundaries of Felsche for pure rare earth disilicates. Circles:  $\beta$ - $\text{RE}_2\text{Si}_2\text{O}_7$ . Squares:  $\gamma$ - $\text{RE}_2\text{Si}_2\text{O}_7$ . Triangles:  $\delta$ - $\text{RE}_2\text{Si}_2\text{O}_7$ .

### NdHO, a novel oxyhydride

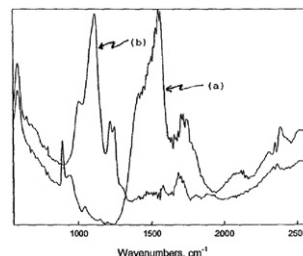
Marius Widerøe, Helmer Fjellvåg, Truls Norby, Finn Willy Poulsen and Rolf Willestofte Berg  
page 1890



View of the NdHO structure.

### Neutron powder diffraction, and solid-state deuterium NMR analyses of $\text{Yb}_2\text{RuD}_6$ and spectroscopic vibrational analysis of $\text{Yb}_2\text{RuD}_6$ and $\text{Yb}_2\text{RuH}_6$

Ralph O. Moyer Jr., Denis F.R. Gilson and Brian H. Toby  
page 1895



Using PAIR (see figure above) and FTIR data spectroscopic vibrational assignments are reported for (a)  $\text{Yb}_2\text{RuH}_6$  and (b)  $\text{Yb}_2\text{RuD}_6$ . In addition, neutron powder diffraction structural elucidation data and deuterium NMR data are reported for  $\text{Yb}_2\text{RuD}_6$ .



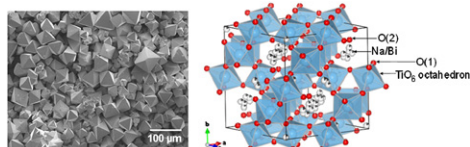
## Rapid Communication

### Preparation of a new pyrochlore-type compound

#### $\text{Na}_{0.32}\text{Bi}_{1.68}\text{Ti}_2\text{O}_{6.46}(\text{OH})_{0.44}$ by hydrothermal reaction

Qiang Dong, Hong Jiang, Nobuhiro Kumada, Yoshinori Yonesaki, Takahiro Takei and Nobukazu Kinomura

page 1899



SEM image and schematic representation of the structure of  $\text{Na}_{0.32}\text{Bi}_{1.68}\text{Ti}_2\text{O}_{6.46}(\text{OH})_{0.44}$ .

### Author inquiries

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