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Research Progress on Modification of Organisms by Biomimetic Inorganic Nanomaterials

XIONG Wei, TANG Rui-Kang, MA Wei-Min, ZOU Zhi-Gang

DOI:10.11862/CJIC.2019.008

Chinese J. Inorg. Chem., **2019**,**35**(1):1-24

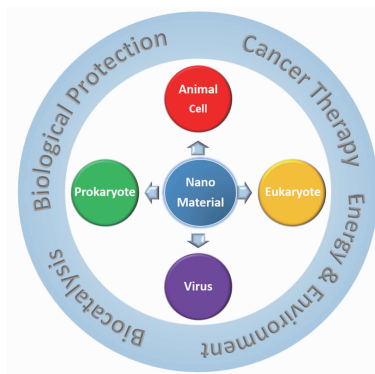
Reviews

Research Progress on Modification of Organisms by Biomimetic Inorganic Nanomaterials

XIONG Wei, TANG Rui-Kang, MA Wei-Min, ZOU Zhi-Gang

DOI:10.11862/CJIC.2019.008

Chinese J. Inorg. Chem., **2019**,**35**(1):1-24

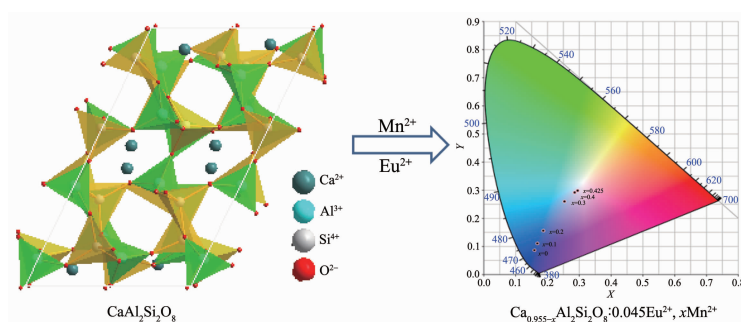


In nature, many organisms can use inorganic materials to adapt themselves to the changes in the environment. This feature article reviews recent achievements of organism improvements by various biomimetic inorganic nanomaterials and related applications.

Articles

Lattice Parameters and Luminescent Property of Single-Phase White Light-Emitting $\text{Ca}_{0.955-x}\text{Al}_2\text{Si}_2\text{O}_8:0.045\text{Eu}^{2+}, x\text{Mn}^{2+}$ Phosphors

WANG Fei, TIAN Yi-Guang, ZHANG Qiao



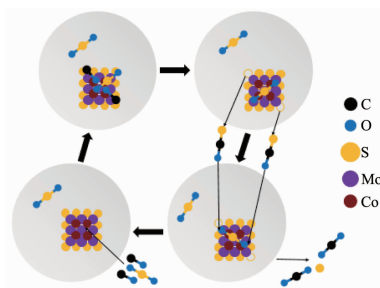
DOI:10.11862/CJIC.2019.003

Chinese J. Inorg. Chem., **2019**,**35**(1):25-33

The complete solid solutions are formed in the whole range for x while Mn^{2+} and Eu^{2+} enter the $\text{CaAl}_2\text{Si}_2\text{O}_8$ lattice and substitutes for Ca^{2+} , obtaining a single-component white phosphor $\text{Ca}_{0.955-x}\text{Al}_2\text{Si}_2\text{O}_8:0.045\text{Eu}^{2+}, x\text{Mn}^{2+}$ suitable for white LEDs.

Adsorption Properties and Catalytic Activity of $\text{CoMoS}_x/\gamma\text{-Al}_2\text{O}_3$ Catalysts in Reduction Desulfurization

LIU Zhe-Nan, GENG Yun-Feng, SHI Quan,
LI Han-Sheng, SHI Da-Xin, WU Qin,
ZHAO Yun, FENG Cai-Hong, JIAO Qing-Ze



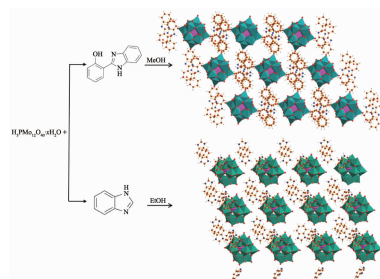
The Catalytic reduction of SO_2 to sulfur by CO was systematically investigated and the sulfur cycle in the reaction mechanism and catalytic activity were revealed.

DOI:10.11862/CJIC.2019.004

Chinese J. Inorg. Chem., **2019**,**35**(1):34-42

Two Inorganic-Organic Hybrid Crystals Based on Polyoxometallates and Imidazole Compounds: Syntheses and Properties

ZHOU Xin, YE Jing, WANG Zhi-Hua,
JIN Su-Rong



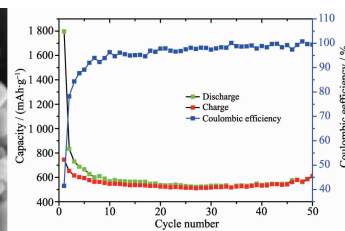
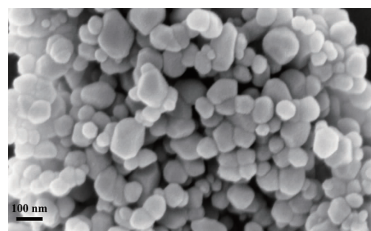
Based on phosphomolybdic acid hydrate, two different hybrid crystals were synthesized and their photocatalytic degradation of MB and RHB were investigated.

DOI:10.11862/CJIC.2019.023

Chinese J. Inorg. Chem., **2019**,**35**(1):43-49

Two Dimensional Coordination Polymer Derived Nitrogen-Doped Carbon/ZnO Nanocomposites as High Performance Anode Material of Lithium-Ion Batteries

WEN Hao, SHI Chang-Dong, HU Yao,
RONG Hong-Ren, SHA Yan-Yong,
LIU Hong-Jiang, ZHANG Han-Ping, LIU Qi



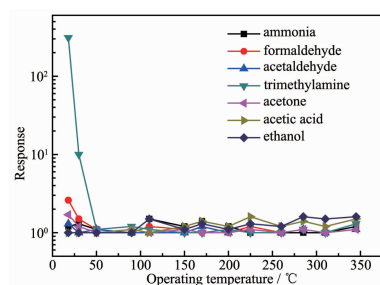
Nitrogen-doped carbon/ZnO nanocomposites was obtained via calcination of a 2D zinc-based coordination polymer display high capacity and excellent cyclic stability as an anode material for lithium-ion batteries.

DOI:10.11862/CJIC.2019.015

Chinese J. Inorg. Chem., **2019**,**35**(1):50-58

Preparation and Gas-Sensing Properties of CuGa_2O_4 by Co-precipitation Method

GAO Cui-Ping, WANG Yan, CHU Xiang-Feng,
LIANG Shi-Ming, GAO Qi, LI Xue



CuGa_2O_4 sensor exhibited good gas sensing selectivity and high sensitivity at room temperature (18 ± 2 °C). And its responses to $1\,000\,\mu\text{L} \cdot \text{L}^{-1}$ trimethylamine reached 310.1. CuGa_2O_4 powders were characterized by XRD, SEM, XPS, etc.

DOI:10.11862/CJIC.2019.005

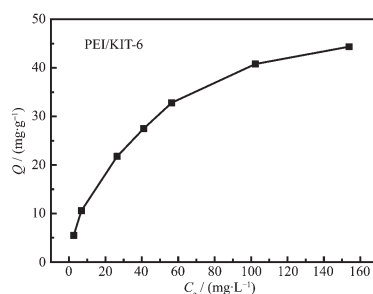
Chinese J. Inorg. Chem., **2019**,**35**(1):59-64

Amino Functionalized KIT-6: Two-Step Post-grafting and Pb^{2+} Adsorption Property

GENG Lin-Lin, LIN Zhi-Feng, MEI De-Jun,
CHEN Si-Qi, WEI Jian-Wen, LIAO Lei

DOI:10.11862/CJIC.2019.001

Chinese J. Inorg. Chem., **2019**,**35**(1):65-72



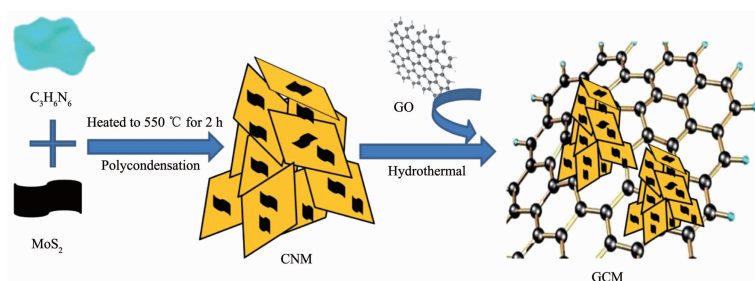
A functionalized PEI/KIT-6 material with amino groups loading of $0.374 \text{ mmol} \cdot \text{g}^{-1}$ was prepared using two-step post-grafting method. It showed an excellent performance for Pb^{2+} adsorption (25°C , $\text{pH}=6.0$, initial concentration of $100 \text{ mg} \cdot \text{L}^{-1}$) and the theoretical maximum adsorption capacity was $52.63 \text{ mg} \cdot \text{g}^{-1}$ calculated by Langmuir adsorption model.

Synthesis and Visible-Light Photocatalytic Activity of RGO/g- C_3N_4 /MoS₂ Composite Photocatalysts

ZHONG Zi-Jun, XU Ruo-Peng,
HUANG Lang-Huan, TAN Shao-Zao,
LUO Zi-Rong

DOI:10.11862/CJIC.2019.024

Chinese J. Inorg. Chem., **2019**,**35**(1):73-81



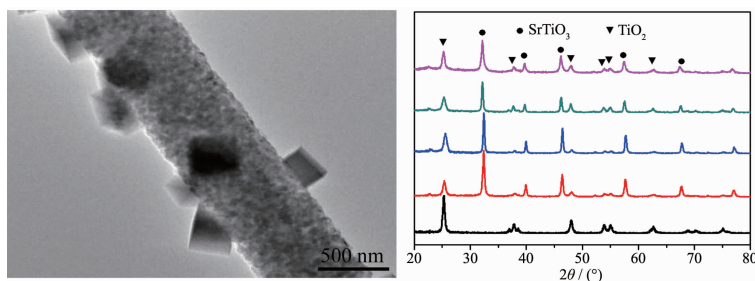
The RGO/g- C_3N_4 /MoS₂ composites were synthesized via the pyrolysis-hydrothermal two-step method, which exhibited superior photocatalytic activity owing to enhanced charge carrier separation via well-contacted interface and fast charge transfer pathway.

Preparation and Photocatalytic Activity of Gd-N Co-doped SrTiO₃/TiO₂ Composite Nanofibers

LI Yue-Jun, CAO Tie-Ping, MEI Zhe-Min,
LI Xiao-Ping, SUN Da-Wei, YANG Dian-Kai

DOI:10.11862/CJIC.2019.011

Chinese J. Inorg. Chem., **2019**,**35**(1):82-88



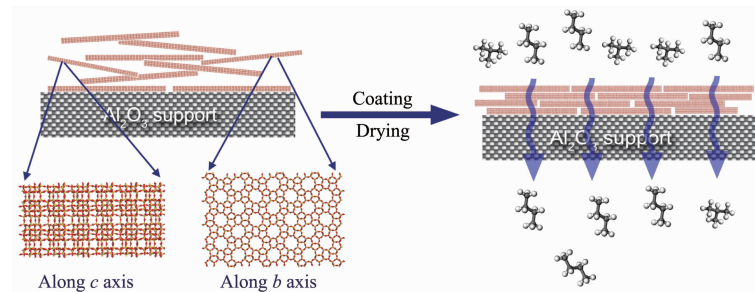
By employing electrospun TiO₂ nanofibers as substrate, Gd-N co-doped SrTiO₃/TiO₂ composite nanofibers were prepared via one-step hydrothermal method, which shows that the photocatalysts obtained well photocatalytic activity and stability.

Fabrication of Zeolite Membranes Using Two-Dimensional Open-Pore MFI Nanosheets as Building Blocks

WU Yun-Qin, ZHENG Lu-Kang, CHEN Qi,
YU Meng-Ting, WANG Jin-Gui, ZHANG Fu-Min,
XIAO Qiang, ZHU Wei-Dong

DOI:10.11862/CJIC.2019.012

Chinese J. Inorg. Chem., **2019**,**35**(1):89-94



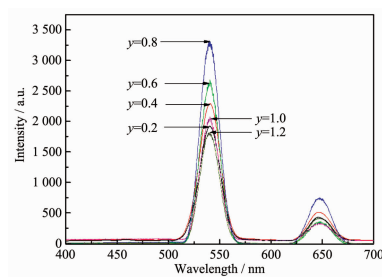
Open-pore MFI nanosheets were deposited on Al₂O₃ support to make an isotherm selective MFI nanosheet membrane.

Preparation and Luminescence Properties of Ho³⁺-Yb³⁺ Co-doped Phosphate Glass-Ceramics

ZHAO Meng-Jie, ZOU Xiang-Yu, XIA Yu-Hang, JIA Wen-Tao, ZHANG Hong-Bo, SHAO Jing, SU Chun-Hui

DOI:10.11862/CJIC.2019.007

Chinese J. Inorg. Chem., **2019**,**35**(1):95-100



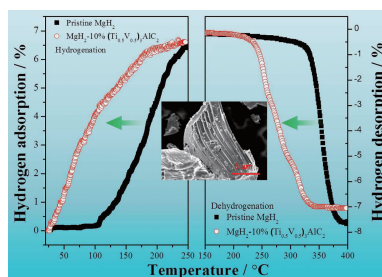
Enhancement of Ho³⁺ up conversion emission intensity in glass ceramics was enhanced with Yb³⁺ incorporation.

Synthesis and Catalytic Effects of Solid-Solution MAX-phase (Ti_{0.5}V_{0.5})₃AlC₂ on Hydrogen Storage Performance of MgH₂

ZHANG Xin, SHEN Zheng-Yang, JIAN Ni, YAO Jian-Hua, GAO Ming-Xia, PAN Hong-Ge, LIU Yong-Feng

DOI:10.11862/CJIC.2019.025

Chinese J. Inorg. Chem., **2019**,**35**(1):101-108



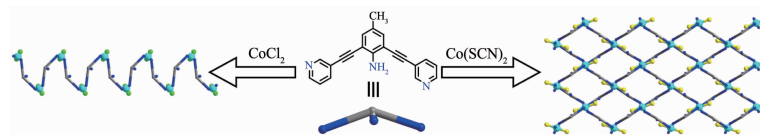
A solid-solution MAX phase (Ti_{0.5}V_{0.5})₃AlC₂ with layer structure was successfully synthesized, which exhibits superior catalytic activity on dehydrogenation/hydrogenation properties of MgH₂, thanks to the synergistic catalysis effect of Ti and V.

Syntheses, Crystal Structures and Fluorescence Properties of Co(II) Coordination Polymers Based on Anion Regulation Strategy

LI Xiang, ZHAO Huai-An, SU Jian, CHENG Jun-Yan, WANG Peng

DOI:10.11862/CJIC.2019.020

Chinese J. Inorg. Chem., **2019**,**35**(1):109-115



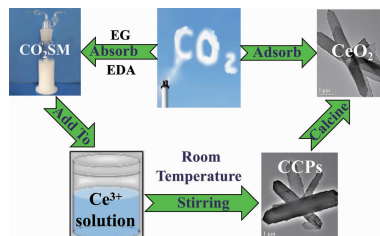
Using the ligand (4-methyl-2,6-bis(pyridin-3-ylethynyl) aniline, L) and Co(II) under the same condition but different anions (Cl⁻ or SCN⁻), coordination complexes **1** with 1D chain structure and **2** with 2D sheet structure were obtained. The reason for different structures is the four and six coordination modes of Co(II) ions in **1** and **2**, respectively.

Preparation and CO₂ Adsorption Property of Flake-like Nano-Structure CeO₂ Crystals (English)

ZHAO Bo-Sheng, SHI Hui-Hu, MA Liang, DU Hong, ZHANG Jian-Bin

DOI:10.11862/CJIC.2019.019

Chinese J. Inorg. Chem., **2019**,**35**(1):116-124



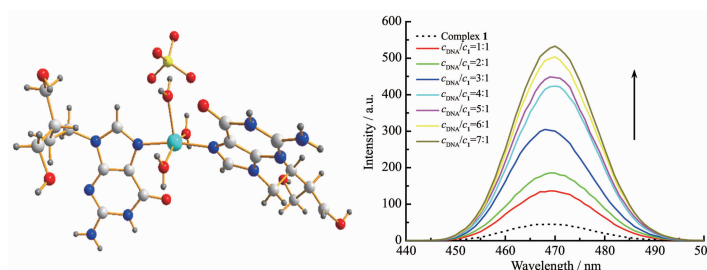
This method provided a new idea for the rapid synthesis of metal oxides and investigated the performance of metal oxides for carbon dioxide adsorption.

Synthesis, Crystal Structure and DNA Binding of Copper(II) Complex of Penciclovir (English)

LIU Rui-Xue, LAI De-Lin, DENG Qian-Jun, CHENG Feng-Jie, FAN Lan-Qiong, LIU Yan-Cheng

DOI:10.11862/CJIC.2019.013

Chinese J. Inorg. Chem., **2019**,**35**(1):125-132



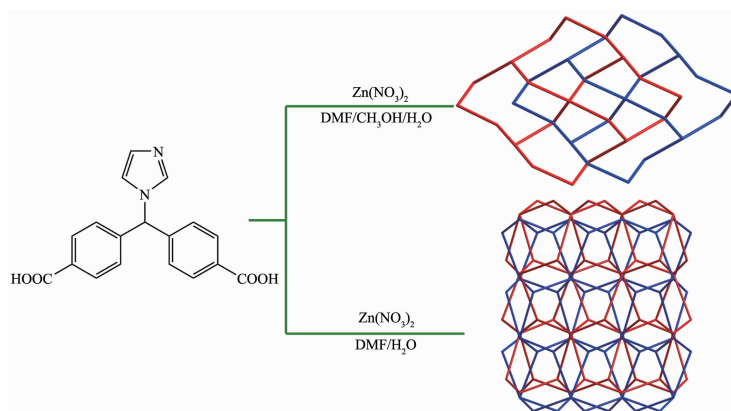
A new copper(II) complex of penciclovir (PCV) exhibited enhanced *in vitro* antitumor activity than PCV towards a series tumor cell lines, in which BEL-7404 was the most sensitive cell line. It bound with DNA via a classic intercalative binding mode, which might contribute to its antitumor activity.

Syntheses, Crystal Structures and Photoluminescent Properties of Two Zinc(II) Coordination Polymers Derived from 4,4'-((1*H*-Imidazol-1-yl)methylene) dibenzoic Acid (English)

YU Min, XUAN Fang, LIU Guang-Xiang

DOI:10.11862/CJIC.2019.018

Chinese J. Inorg. Chem., **2019**,**35**(1):133-140

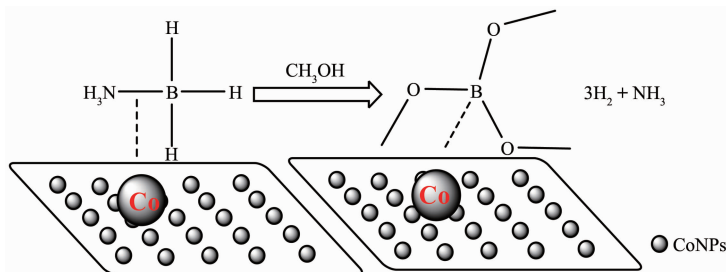


In-Situ Formed Amorphous Co Nanoparticles for Efficiently Catalytic Hydrogen Production from the Methanolysis of Ammonia Borane (English)

CHEN Hao, YU Zhe-Jian, XU Dan-Dan, LI Yang, WANG Ming-Ming, XIA Liang-Min, LUO Shu-Ping

DOI:10.11862/CJIC.2019.017

Chinese J. Inorg. Chem., **2019**,**35**(1):141-148



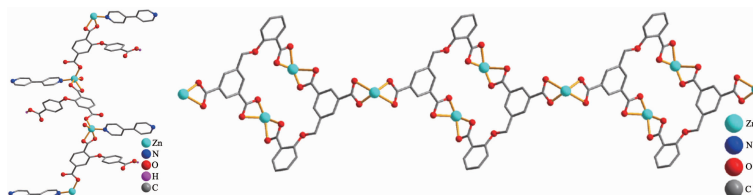
Amorphous Co nanoparticles obtained by *in-situ* method in the methanolysis of ammonia borane easily, only using cobalt dichloride, displayed high catalytic activity and great recycling performance for hydrogen generation under room temperature.

Syntheses, Crystal Structures and Luminescent Properties of Two Zinc(II) Coordination Polymers Constructed from Ether-Bridged Tricarboxylic Acid (English)

LI Yu, ZOU Xun-Zhong, ZHUANG Wen-Liu, QIU Wen-Da, GU Jin-Zhong

DOI:10.11862/CJIC.2019.009

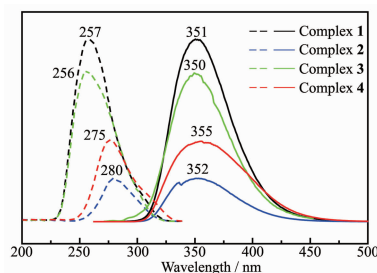
Chinese J. Inorg. Chem., **2019**,**35**(1):149-154



Two 1D chain coordination polymers $[Zn(\mu\text{-Hcpta})(4,4'\text{-bipy})(H_2O)]_n$ (**1**) and $\{[Zn_3(\mu_3\text{-dbba})_2(phen)_3] \cdot 6H_2O\}_n$ (**2**), have been constructed and the structures and luminescent properties of the complexes were investigated.

Syntheses, Crystal Structures and Properties of Cu(II), Ni(II) and Cd(II) Complexes Based on 4-Methyl-3-phenyl-5-(2-pyridyl)-1,2,4-triazole (English)

HE Wei-Wei, FENG Si-Yang, QU Zhi-Rong,
TANG Hui, WANG Zuo-Xiang



Four 3D network structural complexes based on 4-methyl-3-phenyl-5-(2-pyridyl)-1,2,4-triazole were synthesized. The central Cu(II) ion in $[\text{CuL}_2\text{Cl}]\text{Cl} \cdot \text{H}_2\text{O}$ (**1**) has a distorted tetragonal pyramid geometry $[\text{CuN}_4\text{Cl}]$, while the central metal ions in $[\text{NiL}_2(\text{H}_2\text{O})_2](\text{NO}_3)_2$ (**2**), $[\text{CuL}_2(\text{H}_2\text{O})_2](\text{ClO}_4)_2$ (**3**) and $[\text{CdL}_2(\text{NO}_3)_2] \cdot \text{CH}_3\text{CN}$ (**4**) have distorted octahedral geometries. Complexes **1**~**4** all showed fluorescence properties with the fluorescence quantum yield being 0.63, 0.56, 0.65 and 0.58, respectively.

DOI:10.11862/CJIC.2019.010

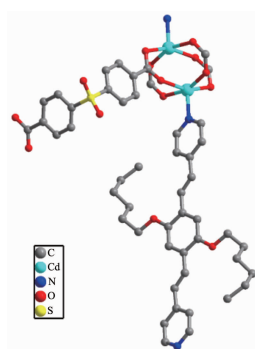
Chinese J. Inorg. Chem., **2019**,**35**(1):155-164

Two Cd(II)-Based Metal-Organic Frameworks for Luminescence Sensing of Metal Ions and Organic Molecules (English)

ZHANG Chun-Li

DOI:10.11862/CJIC.2019.021

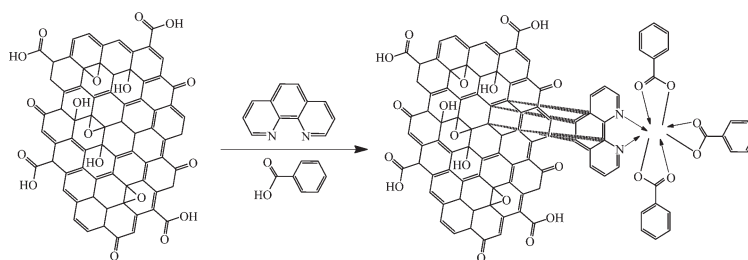
Chinese J. Inorg. Chem., **2019**,**35**(1):165-173



Two cadmium metal-organic frameworks have been hydrothermally synthesized. Their applications in luminescence sensing of metal anions and organic molecules were explored. The results show that Fe^{3+} has a significant quenching influence on the luminescence intensity of MOFs **1** and **2**. In addition, MOFs **1** and **2** also show some luminescence quenching ability on salicylaldehyde.

Decoration of Graphene Oxide Sheets with Luminescent Heteronuclear Rare-Earth Complexes (English)

LI Yun-Tao, QIU Shuo, DU Teng, WEI Wei,
HAN Zhen-Bing, RUAN Fang-Yi, CAO Li-Hui



The GOSs/(Sm-Gd)BA₃Phen complex hybrid (RE=Sm, Gd) obtained bright fluorescence emissions with red.

DOI:10.11862/CJIC.2019.016

Chinese J. Inorg. Chem., **2019**,**35**(1):174-182