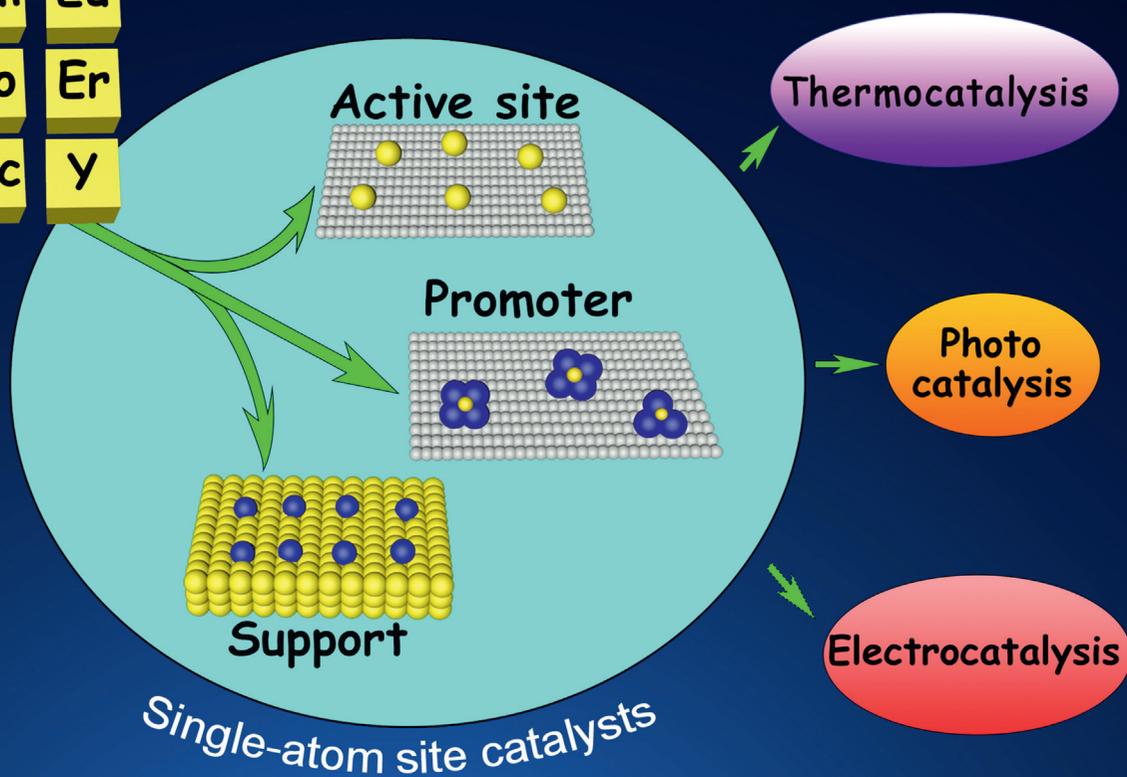


# Journal of Rare Earths

Use of Rare Earth Elements  
in Single-atom Site Catalysis:  
A Critical Review

		La		
Ce	Pr	Nb	Sm	Eu
Ga	Tb	Dy	Ho	Er
Tm	Yb	Lu	Sc	Y



万方数据



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- $\text{Er}^{3+}\text{-Yb}^{3+}\text{-Na}^+:\text{ZnWO}_4$  phosphors for enhanced visible upconversion and temperature sensing applications .....*Sonali Biswas, Lakshmi Mukhopadhyay, Manisha Mondal, Vineet Kumar Rai\** 291

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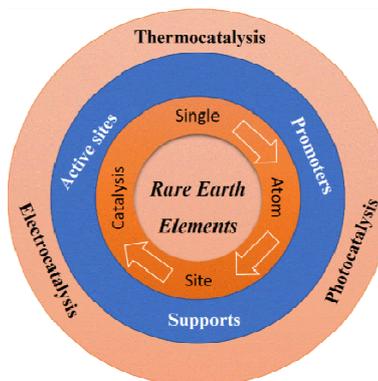
- Wetting of molten cerium on typical carbon materials (graphite, CVD-diamond and NWCNT) and molten Cu–Ce alloys on graphite at 950 °C .....*Ran Sui, Qiaoli Lin\*, Le Wang, Fan Yang* 331
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- Pitting corrosion behavior of cerium treated HSLA steel induced by sulfide inclusions in 3.5 wt% NaCl solution .....*Wan Zheng\*, Xueqiang Yan, Shan Xiong, Guowei Wang, Guangqiang Li* 348

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INVITED REVIEWS

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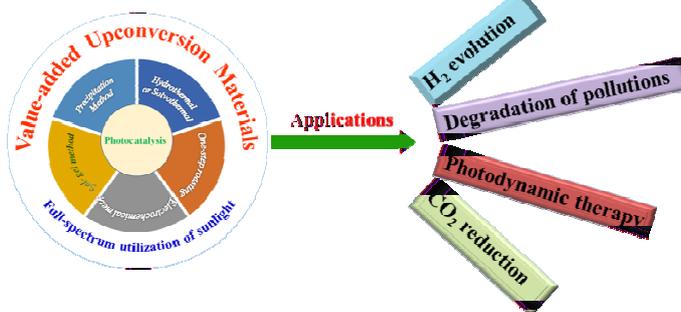


A review about the use of rare earth elements in single-atom site catalysis

*J. Rare Earths*, (39) 2021: 233-242

- 243 High value-added fluorescence upconversion agents-assisted nano-semiconductors for efficient wide spectral response photocatalysis: Exerting energy transfer effect and applications

Kailian Zhang, Man Zhou, Changlin Yu\*\*,  
Xiaoxiao Li, Kai Yang\*, Shi Yang,  
Wenxin Dai, Weiya Huang\*\*\*, Qizhe Fan,  
Lihua Zhu



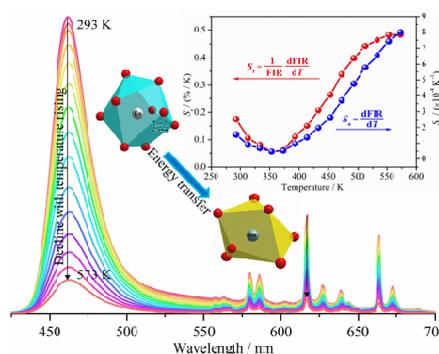
Recent review summarizes the research progress of photocatalytic materials with value-added upconversion effect on photolysis of water for hydrogen production, degradation of organic and inorganic pollutants, reduction of CO<sub>2</sub> and photodynamic therapy, in which upconversion-based nanocomposites can be adopted as the promising candidate in wide-spectral-light-activating photocatalytic materials coupling with conventional semiconductors

*J. Rare Earths*, (39) 2021: 243-260

SPECTROSCOPY, LUMINESCENCE AND PHOSPHORS

- 261 Luminescent and thermometric properties of dual emitting Eu<sup>2+</sup>/Sm<sup>3+</sup> co-doped Sr<sub>4</sub>La(PO<sub>4</sub>)<sub>3</sub>O phosphor based on energy transfer

Fuwen Liu, Degang Deng\*, Ming Wu,  
Bowen Chen, Liuyan Zhou, Shiqing Xu

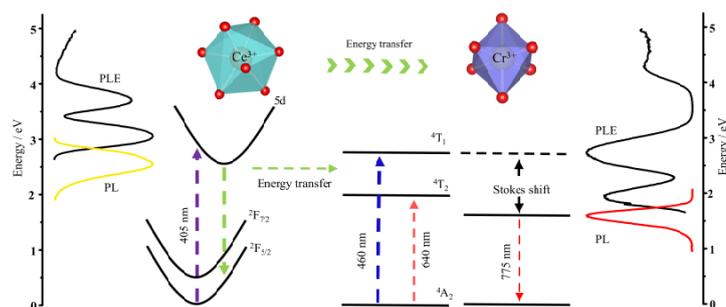


Eu<sup>2+</sup> ions and Sm<sup>3+</sup> ions can occupy the two different sites of Sr<sub>4</sub>La(PO<sub>4</sub>)<sub>3</sub>O host respectively. The luminescence intensities of the two ions have different responses to the rising temperature, and can be used as FIR signals to measure the temperature

*J. Rare Earths*, (39) 2021: 261-268

- 269 Broadband near-infrared luminescence and energy transfer of  $\text{Cr}^{3+}$ ,  $\text{Ce}^{3+}$  co-doped  $\text{Ca}_2\text{LuHf}_2\text{Al}_3\text{O}_{12}$  phosphors

Jinpin Wu, Weidong Zhuang\*, Ronghui Liu, Yuanhong Liu, Tongyu Gao, Chunpei Yan, Min Cao, Junhang Tian, Xiaoxia Chen

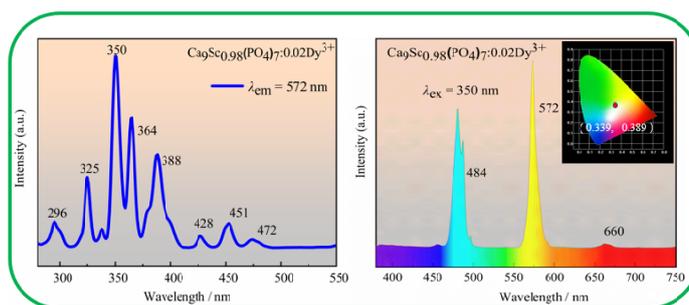


The emission intensity of  $\text{CLHA}:0.03\text{Cr}^{3+},0.03\text{Ce}^{3+}$  increases nearly three times compared with that of sample without  $\text{Ce}^{3+}$  because of the energy transfer from  $\text{Ce}^{3+}$  to  $\text{Cr}^{3+}$ . And the broadband NIR emission peaked at 775 nm is favorable to applications in a low-cost phosphor dominating nondestructive quality-control analysis systems for food

*J. Rare Earths, (39) 2021: 269-276*

- 277 Synthesis, structure and optical properties of novel thermally robust  $\text{Dy}^{3+}$ -doped  $\text{Ca}_9\text{Sc}(\text{PO}_4)_7$  phosphors for NUV-excited white LEDs

Haiyan Wu, Huimin Li, Lihong Jiang\*\*, Ran Pang, Su Zhang, Da Li, Guanyu Liu, Chengyu Li\*, Jing Feng, Hongjie Zhang

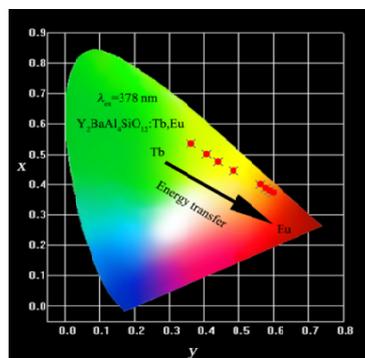


A new single-phase white emitting phosphor  $\text{Ca}_9\text{Sc}(\text{PO}_4)_7:\text{Dy}^{3+}$  was synthesized by a solid state reaction. The CSPO:0.02 $\text{Dy}^{3+}$  phosphor has a broad absorption from 280 to 500 nm, and the main absorption peaks locate at 296, 325, 350,364, 388, 428, 451, and 472 nm, respectively. Under 350 nm excitation, the emission peaks locate at 484, 572, and 660 nm, respectively. The phosphor exhibits white emission and can be effectively excited by NUV LED chips

*J. Rare Earths, (39) 2021: 277-283*

- 284 Tunable luminescence and energy transfer in  $\text{Y}_2\text{BaAl}_4\text{SiO}_{12}:\text{Tb}^{3+},\text{Eu}^{3+}$  phosphors for solid-state lighting

Jie Wang, Xiusha Peng, Danzhao Cheng, Zhigang Zheng, Hai Guo\*

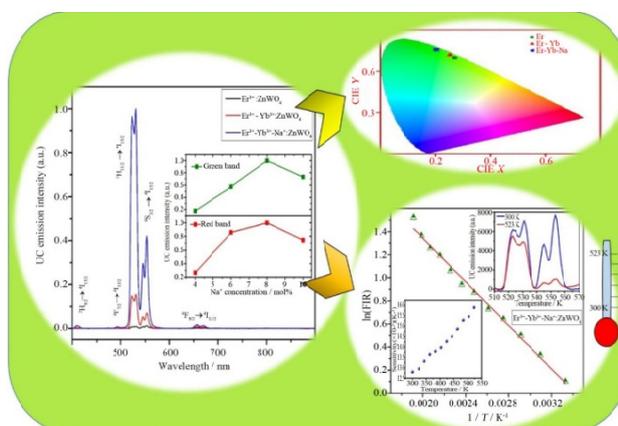


Under the excitation of ultraviolet light (378 nm), the tunable luminescence ranging from green to red was obtained in single-phase  $\text{Y}_2\text{BaAl}_4\text{SiO}_{12}:\text{Tb}^{3+},\text{Eu}^{3+}$  phosphors due to the effective energy transfer

*J. Rare Earths, (39) 2021: 284-290*

- 291  $\text{Er}^{3+}-\text{Yb}^{3+}-\text{Na}^+:\text{ZnWO}_4$  phosphors for enhanced visible upconversion and temperature sensing applications

Sonali Biswas, Lakshmi Mukhopadhyay, Manisha Mondal, Vineet Kumar Rai\*



Enhancement observed in the UC emission intensity as well as in temperature sensing on codoping with  $\text{Yb}^{3+}$  and  $\text{Na}^+$  ions is due to the efficient energy transfer from  $\text{Yb}^{3+}$  to  $\text{Er}^{3+}$  ions and distortion of the local field symmetry in the  $\text{ZnWO}_4$  phosphors. Thus, the developed phosphors can be used in display devices, NIR to green upconverter, optical heater and as temperature sensing probe

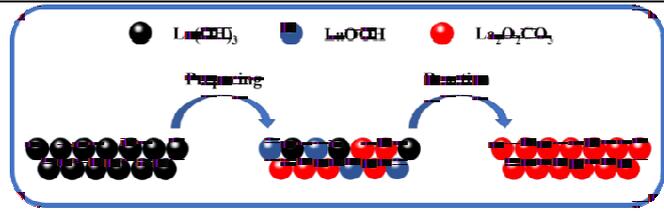
*J. Rare Earths, (39) 2021: 291-296*

## RARE EARTH CATALYSIS

- 297  $\text{LaO}_x(\text{OH})_y$  supported platinum catalysts for CO oxidation: Deactivation by formation of lanthanum carbonate

Luozen Jiang, Junxiang Chen, Rui Si\*

*J. Rare Earths*, (39) 2021: 297-304



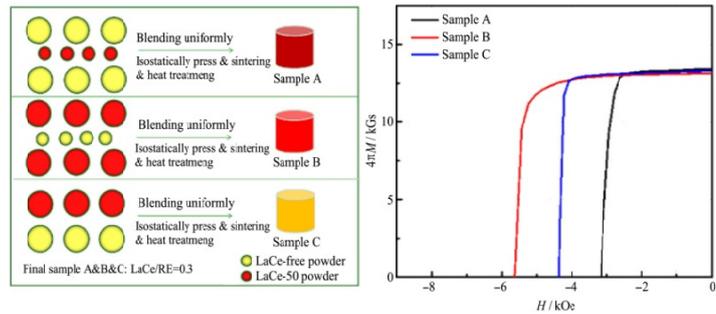
The introduction of  $\text{La}(\text{OH})_3$  translated into carbonates during the sample preparing and catalytic reaction process

## MAGNETISM AND MAGNETIC MATERIALS

- 305 Microstructural design in LaCe misch-metal substituted 2:14:1-type sintered magnets by dual-alloy method

Kan Chen, Shuai Guo\*, Hongliang Zhao, Xiaodong Fan, Fengchun Fan, Guangfei Ding, Renjie Chen\*\*, Xiwen Zheng, Aru Yan

*J. Rare Earths*, (39) 2021: 305-311

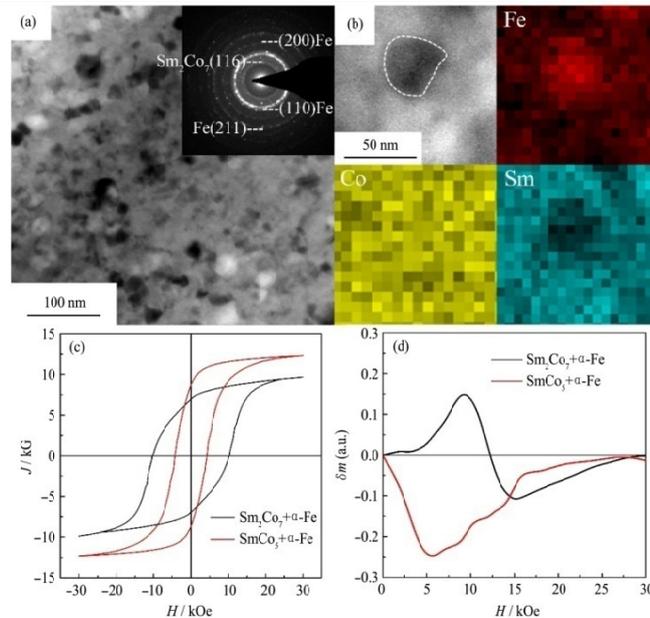


The magnetic properties can be tuned by different dual-alloy methods. Rare-earth elemental enrichment differs at the surface of the matrix grains

- 312 Morphology and magnetic properties of  $\text{Sm}_2\text{Co}_7/\alpha\text{-Fe}$  nanocomposite magnets produced by high energy ball milling and spark plasma sintering

Yitong Zhuge, Yuqing Li, Xiaochang Xu, Dongtao Zhang, Hongguo Zhang, Weiqiang Liu, Ming Yue\*

*J. Rare Earths*, (39) 2021: 312-316

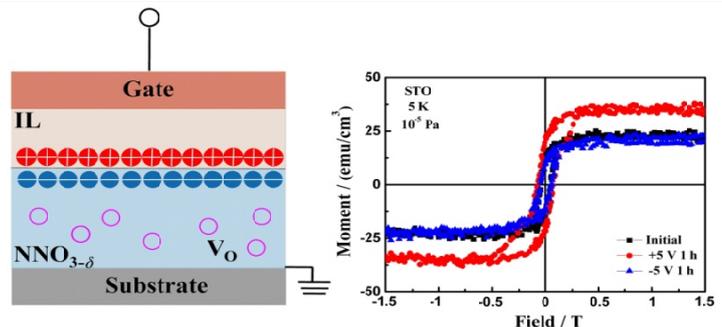


The bright field image and corresponding selected area electron diffraction. The HADDF image (a) and the Fe, Co, Sm element mappings (b) of  $\text{Sm}_2\text{Co}_7 + 20\text{ wt}\% \alpha\text{-Fe}$  magnet; hysteresis loops (c) and  $\delta m$  curves (d) of the  $\text{Sm}_2\text{Co}_7 + 20\text{ wt}\% \alpha\text{-Fe}$  and  $\text{SmCo}_5 + 20\text{ wt}\% \alpha\text{-Fe}$  magnets

- 317 Reversible control of magnetic and transport properties of  $\text{NdNiO}_{3-\delta}$  epitaxial films

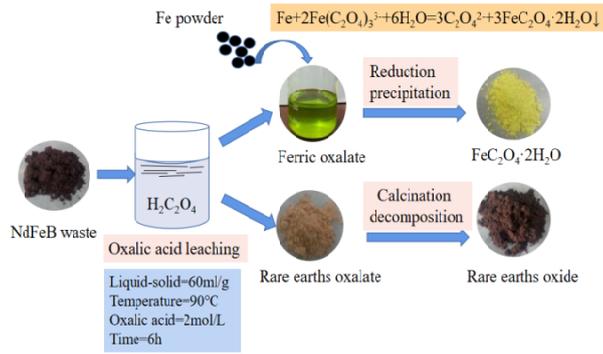
Huihui Ji, Guowei Zhou\*\*, Jun Zhang, Xiaojiao Wang, Xiaohong Xu\*

*J. Rare Earths*, (39) 2021: 317-322



Using the ionic-liquid gating to control oxygen vacancies, the magnetic and transport properties of  $\text{NdNiO}_{3-\delta}$  films can be modulated reversibly

- 323 High-efficiency simultaneous extraction of rare earth elements and iron from NdFeB waste by oxalic acid leaching



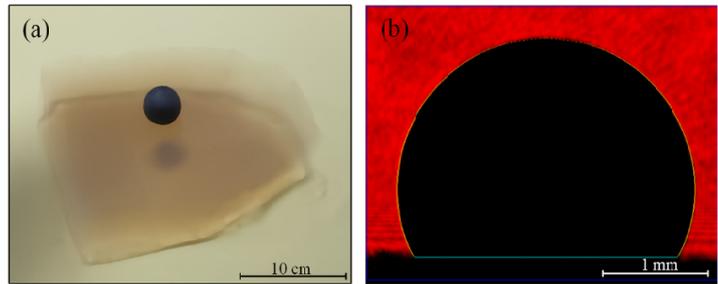
Qingsheng Liu\*, Tao Tu, Hao Guo, Huajin Cheng, Xuezhong Wang

Oxalic acid was efficient to separate and recover rare earth from the roasted NdFeB waste. Under the optimum leaching conditions, the iron leaching efficiency and precipitation rate of rare earth oxalate are both high

*J. Rare Earths*, (39) 2021: 323-330

RARE EARTHS APPLICATIONS

- 331 Wetting of molten cerium on typical carbon materials (graphite, CVD-diamond and NWCNT) and molten Cu–Ce alloys on graphite at 950 °C

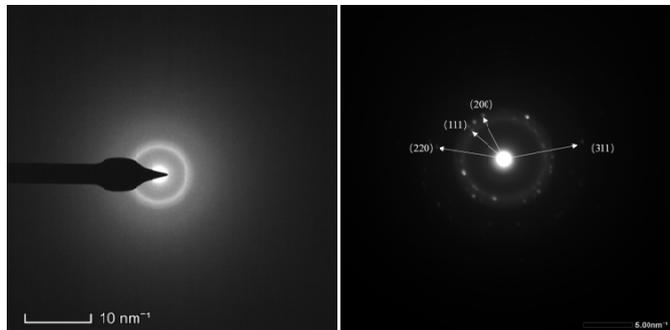


Ran Sui, Qiaoli Lin\*, Le Wang, Fan Yang

The surface tensions of Cu-Ce binary alloys were evaluated by sessile drop method. (a) Ce on silica aerogel; (b) Sessile drop appearance

*J. Rare Earths*, (39) 2021: 331-339

- 340 Preparation of Al-based amorphous coatings and their properties

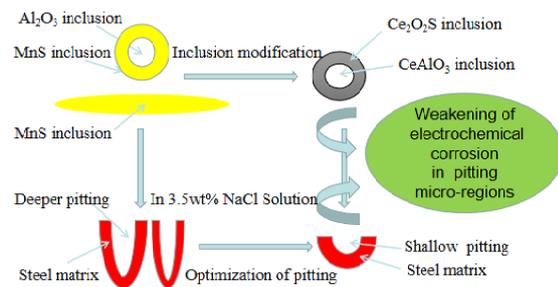


Lei Jin\*, Le Zhang, Kaige Liu, Zhigang Che, Kai Li, Ming Zhang, Bo Zhang

Corrosion was accompanied by the phase transformation of primitive amorphous structure. That is, amorphous materials is changed into crystal structure during neutral salt spray test or other corrosion conditions

*J. Rare Earths*, (39) 2021: 340-347

- 348 Pitting corrosion behavior of cerium treated HSLA steel induced by sulfide inclusions in 3.5 wt% NaCl solution



Wan Zheng\*, Xueqiang Yan, Shan Xiong, Guowei Wang, Guangqiang Li

Weakening of electrochemical corrosion of pitting micro-regions in Ce treated steels is mainly attributed to optimized characteristics of spherical Ce oxysulfide inclusions with less density and smaller average size, inducing fewer pitting holes with bigger opening mouth and shallow depth and therefore causing smaller catalytic corrosion of an occlusion corrosion battery in the pit holes

*J. Rare Earths*, (39) 2021: 348-356