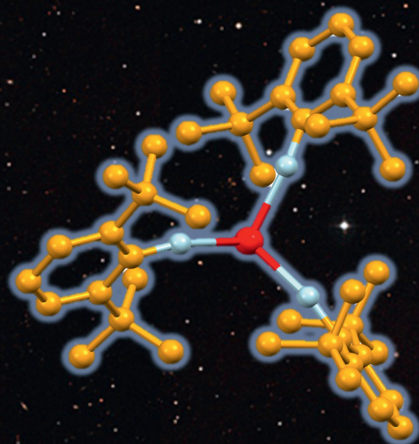
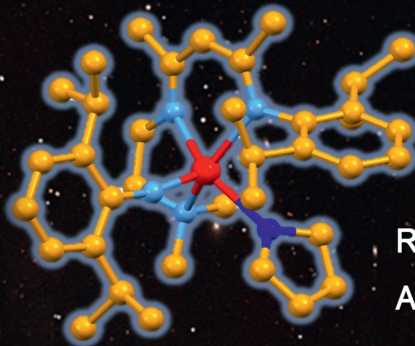
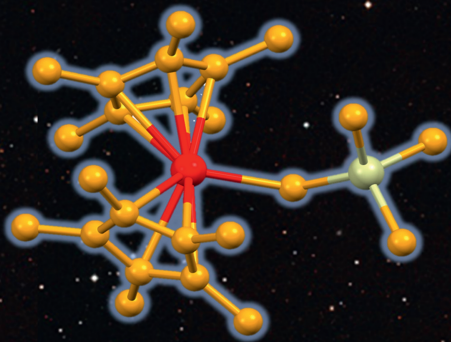
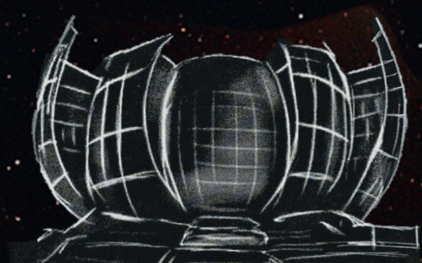


Journal of **Rare Earths**



Rare-Earth Mediated Dihydrogen
Activation and Catalytic Hydrogenation



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RARE EARTHS APPLICATIONS

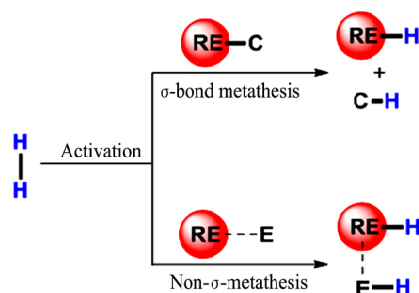
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INVITED REVIEW

- 1017 Rare-earth mediated dihydrogen activation and catalytic hydrogenation

Yiwen Guan, Erli Lu*, Xin Xu**



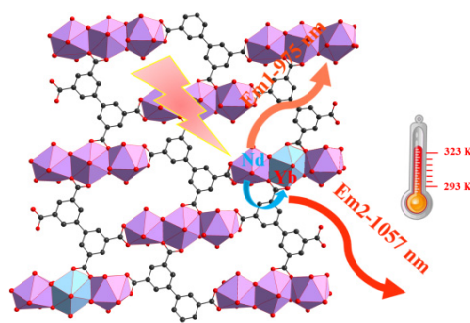
Dihydrogen activation by well-defined rare-earth metal complexes is reviewed, which is organized in two parts depending on the different mechanisms, namely σ -bond metathesis and non- σ -metathesis

J. Rare Earths, (39) 2021: 1017-1023

SPECTROSCOPY, LUMINESCENCE AND PHOSPHORS

- 1024 Near-infrared luminescent $\text{Nd}^{3+}/\text{Yb}^{3+}$ -codoped metal-organic framework for ratiometric temperature sensing in physiological range

Chao Gu, Yanyun Ding, Xinghua Quan, Mengyao Gong, Jiulong Yu, Dian Zhao*, Chunxia Li**

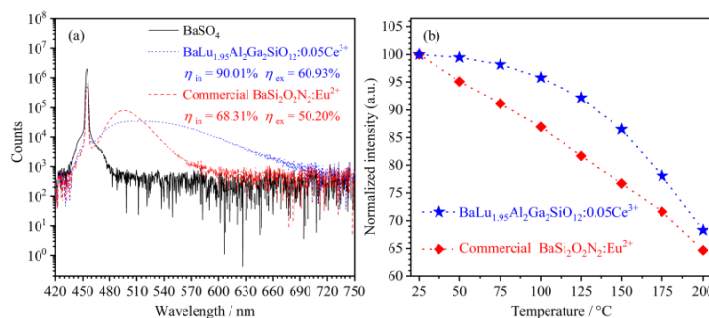


A new $\text{Nd}^{3+}/\text{Yb}^{3+}$ -codoped metal-organic framework having near-infrared absorption and near-infrared emission features was developed as a ratiometric thermometer in the physiological temperature range from 293 to 323 K

J. Rare Earths, (39) 2021: 1024-1030

- 1031 Ce^{3+} doped $\text{BaLu}_{1.95}\text{Al}_2\text{Ga}_2\text{SiO}_{12}$ — A novel blue-light excitable cyan-emitting phosphor with ultrahigh quantum efficiency and excellent stability for full-spectrum white LEDs

Mingzhang Liang, Jianfei Xu, Yaochun Qiang*, Haojian Kang, Lulu Zhang, Jie Chen, Chun Liu, Xianbi Luo, Ying Li, Jingjing Zhang, Liqing Ouyang, Weixiong You, Xinyu Ye**

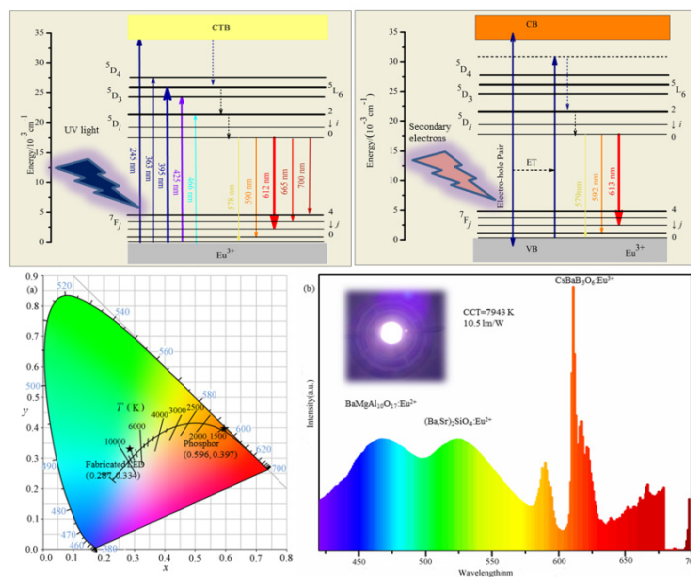


$\text{BaLu}_{1.95}\text{Ce}_{0.05}\text{Al}_2\text{Ga}_2\text{SiO}_{12}$ is a blue-light excitable cyan-emitting phosphor. Its quantum efficiency and thermal stability of luminescence are much better than those of the commercial $\text{BaSi}_2\text{O}_2\text{N}_2:\text{Eu}^{2+}$

J. Rare Earths, (39) 2021: 1031-1039

- 1040 CsBaB₃O₆:Eu³⁺ red-emitting phosphors for white LED and FED: Crystal structure, electronic structure and luminescent properties

Quansheng Wu, Yujie Xie, Fang She,
Quan Zhao, Jianyan Ding*,
Jiangcong Zhou**

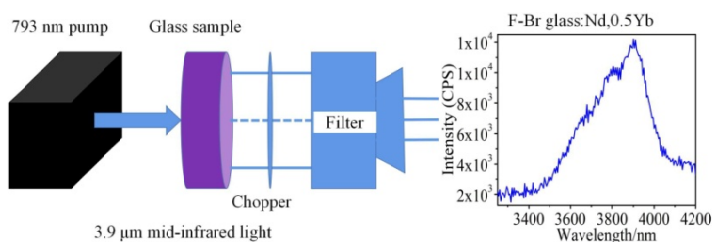


CsBaB₃O₆:Eu³⁺ red phosphor can be effectively excited by n-UV light and electron beam and has potential of being used as multifunctional materials for WLEDs and FEDs

J. Rare Earths, (39) 2021: 1040-1048

- 1049 Nd³⁺/Yb³⁺ co-doped mid-infrared luminescence fluorobromide glass with energy transfer and zero-thermal-quenching IR emission

Jiajia Zhang, Xiaosong Zhang*, Hao Yin,
Lan Li, Zhaowei Zhang, Xin Liu,
Xiaokai Gong, Rukun Ding



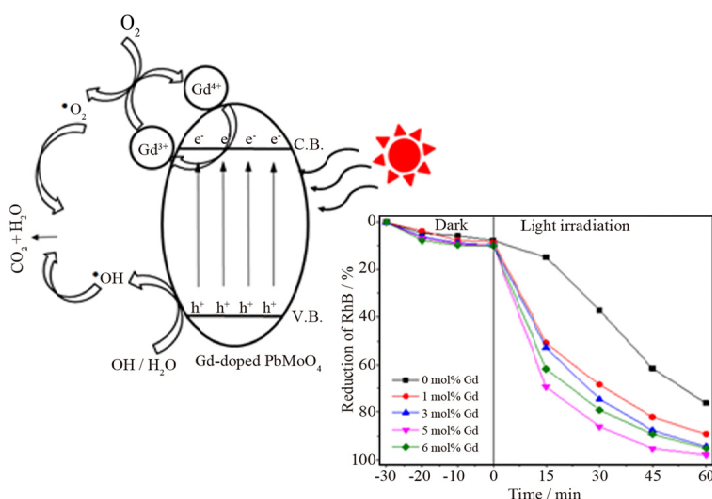
Under the action of Nd³⁺/Yb³⁺ co-doping, 3.9 μm mid-infrared light source is obtained at 793 nm laser pumping

J. Rare Earths, (39) 2021: 1049-1055

RARE EARTH CATALYSIS

- 1056 Synthesis and characterization of Gd-doped PbMoO₄ nanoparticles used for UV-light-driven photocatalysis

Anukorn Phuruangrat*, Somchai Thongtem,
Titipun Thongtem**

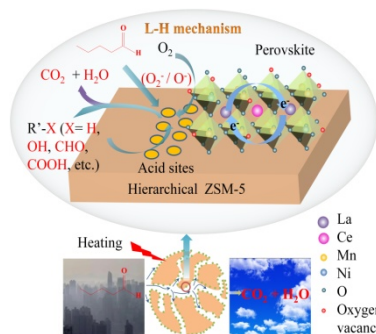


Schematic illustration for photocatalytic mechanism of Gd-doped PbMoO₄ nanoparticles and reduction of RhB in the dark and under UV radiation caused by 0 mol%, 1 mol%, 3 mol%, 5 mol% and 6 mol% Gd-doped PbMoO₄ nanoparticles

J. Rare Earths, (39) 2021: 1056-1061

- 1062 Active oxygen species and oxidation mechanism over Ce-doped $\text{LaMn}_{0.8}\text{Ni}_{0.2}\text{O}_3$ /hierarchical ZSM-5 in pentanal oxidation

Jian Li, Yingjie Shi*, Xiaoheng Fu, Yun Shu, Jiayu Huang, Jinwei Zhu, Gang Tian, Jingnan Hu

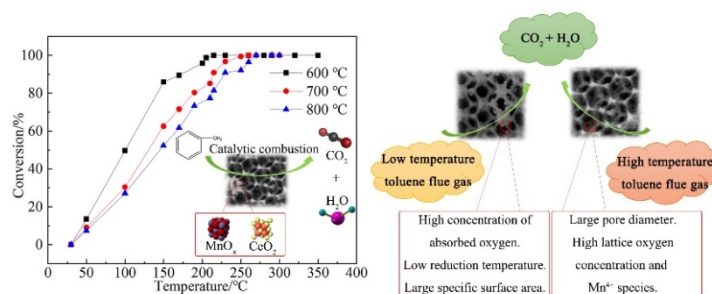


Hierarchical ZSM-5(HZ) can improve the diffusion efficiency of reactants and products due to many mesoporous structures. Appropriate amount of Ce substitution at La sites of $\text{LaMn}_{0.8}\text{Ni}_{0.2}\text{O}_3$ /hierarchical ZSM-5 can promote the electron transfer between all the elements, facilitating the generation of surface adsorbed oxygen species (O_2^- and O^-) on the oxygen vacancies, which are the main reactive oxygen species in pentanal oxidation. Additionally, there is a synergistic catalytic effect between surface acidity and redox ability on the interface between $\text{La}_{1-x}\text{Ce}_x\text{Mn}_{0.8}\text{Ni}_{0.2}\text{O}_3$ and HZ, which can promote the adsorption, decomposition and oxidation of pentanal, corresponding to the L-H mechanism

J. Rare Earths, (39) 2021: 1062-1072

- 1073 Effect of calcination process on performance of 3DOM CeMnO_3 catalysts

Xin Liu, Xinyi Lv, Yongqiang Wang*, Chaocheng Zhao, Fang Liu



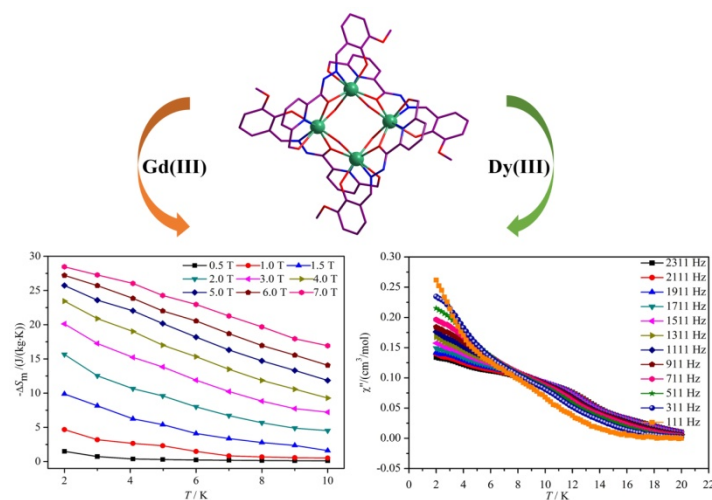
3DOM CeMnO_3 catalyst calcined at 600 °C exhibits a complete macropore structure with a larger specific surface area, a higher concentration of adsorbed oxygen and Mn^{4+} substance, and shows the best catalytic combustion performance of toluene. The 3DOM CeMnO_3 catalyst prepared at a heating rate of 1 °C/min is conducive to the treatment of high-temperature flue gas, while the catalyst prepared at a heating rate of 5 °C/min is more suitable for the treatment of low-temperature flue gas

J. Rare Earths, (39) 2021: 1073-1081

MAGNETISM AND MAGNETIC MATERIALS

- 1082 Synthesis of two lanthanide clusters Ln^{III}_4 (Gd_4 and Dy_4) with $[2 \times 2]$ square grid shape: Magnetocaloric effect and slow magnetic relaxation behaviors

Chunying Xu, Zhilei Wu*, Chenjuan Fan, Lili Yan, Wenmin Wang**, Baoming Ji***

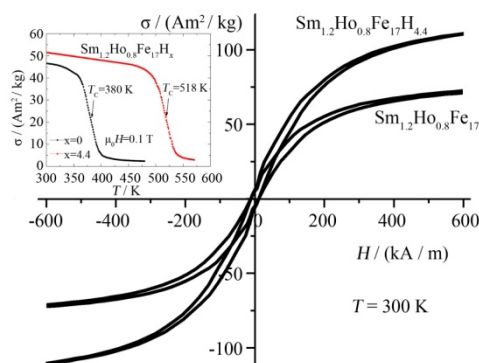


Two $[2 \times 2]$ square grid tetranuclear lanthanide clusters display significant magnetocaloric effect and slow magnetic relaxation behaviors

J. Rare Earths, (39) 2021: 1082-1088

1089 Synthesis, structure and magnetic properties
of $\text{Sm}_{1.2}\text{Ho}_{0.8}\text{Fe}_{17}\text{H}_x$ ($x=0; 4.4$)

S.V. Veselova, M.A. Paukov, I.S. Tereshina,
V.N. Verbetsky, K.V. Zakharov,
D.I. Gorbunov, A.N. Vasil'ev*



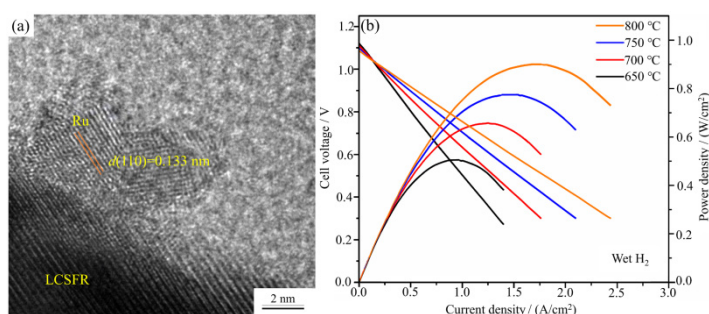
Curie temperature and magnetization at room temperature of the hydride $\text{Sm}_{1.2}\text{Ho}_{0.8}\text{Fe}_{17}\text{H}_{4.4}$ are much higher than those of parent compound. The coercivity of both samples is the same ($H_c \approx 11$ kA/m)

J. Rare Earths, (39) 2021: 1089-1094

ADVANCED RARE EARTH MATERIALS

1095 Cerium and ruthenium co-doped
 $\text{La}_{0.7}\text{Sr}_{0.3}\text{FeO}_{3-\delta}$ as a high-efficiency
electrode for symmetrical solid oxide fuel
cell

*Junkai Wang, Lei Fu, Jiaming Yang, Ke Wu,
Jun Zhou*, Kai Wu***

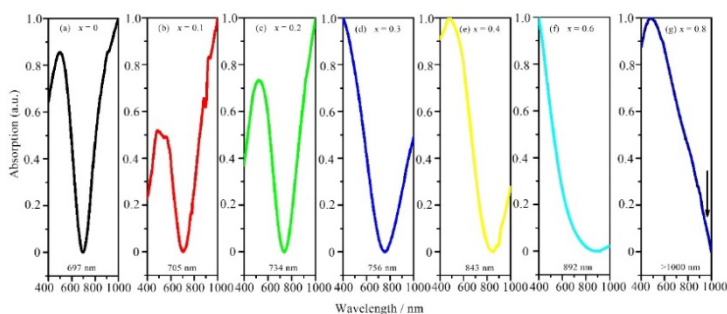


In this work, a novel Ce and Ru co-doped perovskite oxide, $\text{La}_{0.6}\text{Ce}_{0.1}\text{Sr}_{0.3}\text{Fe}_{0.95}\text{Ru}_{0.05}\text{O}_{3-\delta}$ (LCSFR) was synthesized. The exsolved metallic Ru nanoparticles were also confirmed after reduction and enhanced the catalytic activity of hydrogen oxidation of LCSFR greatly, which shows a competitive cell performance of 904 mW/cm^2 at 800°C using humidified H_2 (3% H_2O) as the fuel

J. Rare Earths, (39) 2021: 1095-1099

1100 Mechanism for transmittance light tunable
property of nanocrystalline Eu-doped SmB_6 :
Experimental and first-principles study

Lihong Bao, Jun Ning, Narengerile,
Zizhong Liu*

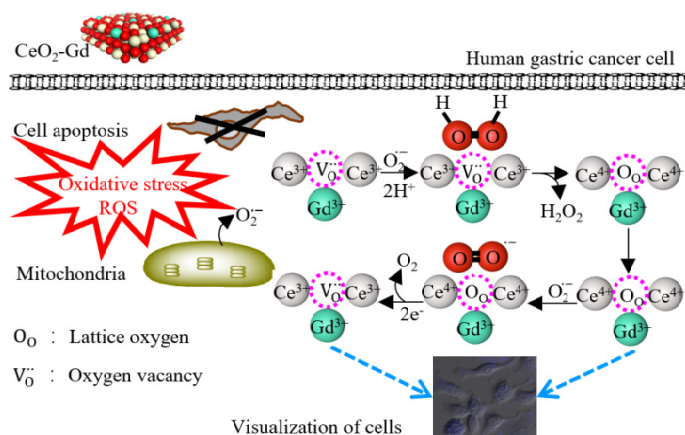


Transmittance wavelength of nanocrystalline SmB_6 increases from 696 nm to exceeding 1000 nm with the Eu doping content increasing to $x=0.8$. This is because the Eu doping into nanocrystalline SmB_6 effectively reduces the conduction-electron number and leads to reduction of plasma frequency excitation energy

J. Rare Earths, (39) 2021: 1100-1107

- 1108 Oxygen vacancy enhanced biomimetic superoxide dismutase activity of CeO₂-Gd nanozymes

Xiangcheng Shi, Jingjie Yang, Xintong Wen, Fuli Tian, Changyan Li*



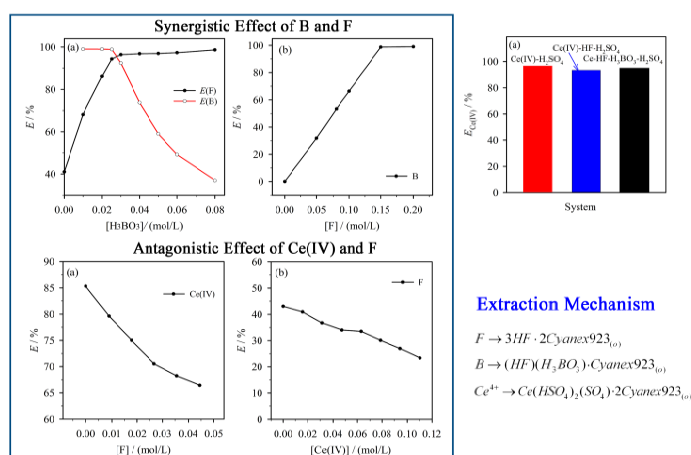
CeO₂-Gd biomimetic nanozyme was fabricated for evaluating superoxide dismutase activity *in vitro* cell (BGC-803). Doping the CeO₂ lattice with trivalent dopants (Gd³⁺) significantly increases the surface Ce³⁺ ion concentration and oxygen vacancy, which enhances superoxide dismutase (SOD) activity and fluorescence intensity of CeO₂-Gd in BGC-803 cells

J. Rare Earths, (39) 2021: 1108-1116

CHEMISTRY AND HYDROMETALLURGY

- 1117 Thermodynamic and application study of complicated extraction system Ce(IV)-HF-H₃BO₃-H₂SO₄ using Cyanex 923

Dan Zou, Hailian Li, Ji Chen*, Deqian Li

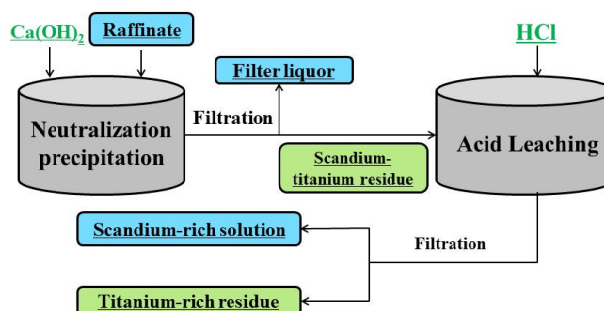


It is noteworthy that there is synergistic effect between B-F and antagonistic effect between Ce(IV)-F in the extraction process by Cyanex 923. And it is found that H₃BO₃ can promote the extraction of F in quantitation by Cyanex 923. Based on those results, the extraction mechanism of complicated system Ce(IV)-HF-H₃BO₃-H₂SO₄ was also further determined

J. Rare Earths, (39) 2021: 1117-1125

- 1126 Separation and recovery of scandium and titanium from red mud leaching liquor through a neutralization precipitation-acid leaching approach

Qingyuan Lei, Dewen He**, Kanggen Zhou, Xuekai Zhang, Changhong Peng, Wei Chen*

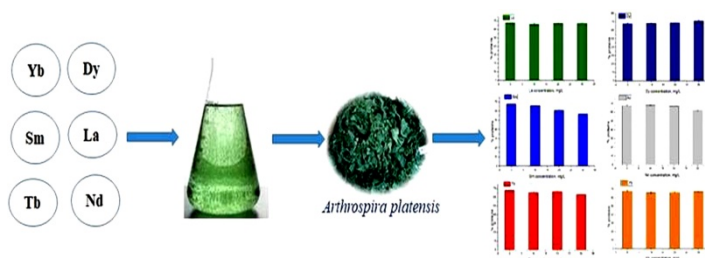


A new approach was proposed to separate and recover Sc and Ti from red mud, and separation of Sc and Ti was remarkable by this method with low scandium loss

J. Rare Earths, (39) 2021: 1126-1132

- 1133 Accumulation of dysprosium, samarium, terbium, lanthanum, neodymium and ytterbium by *Arthrospira platensis* and their effects on biomass biochemical composition

Inga Zinicovscaia*, Liliana Cepoi,
Ludmila Rudi, Tatiana Chiriac,
Dmitrii Grozdov, Sergey Pavlov,
Svetlana Djur



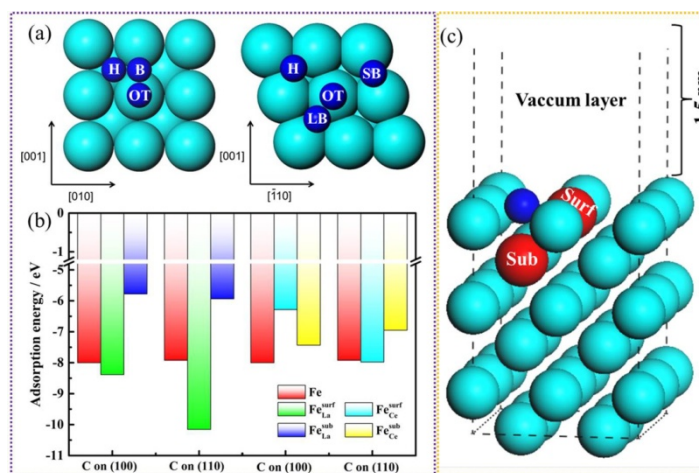
Arthrospira (spirulina) platensis is shown to be a good candidate for REE elements recovery from polluted industrial effluents due to its tolerance to high concentrations of REEs

J. Rare Earths, (39) 2021: 1133-1143

RARE EARTHS APPLICATIONS

- 1144 Effect of rare-earth doping on adsorption of carbon atom on ferrum surface and in ferrum subsurface: A first-principles study

Yang Yang, Xiang Zhou, Faqing Pan,
Zuju Ma, Rongjian Sa, Jun Zheng*,
Qimin Wang**



Carbon adsorption on Fe surface and in Fe subsurface with rare earth substitution were studied by first-principles calculations

J. Rare Earths, (39) 2021: 1144-1150