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Journal of Materiomics Vol 1, 2015

Graphical Abstracts

Review Articles

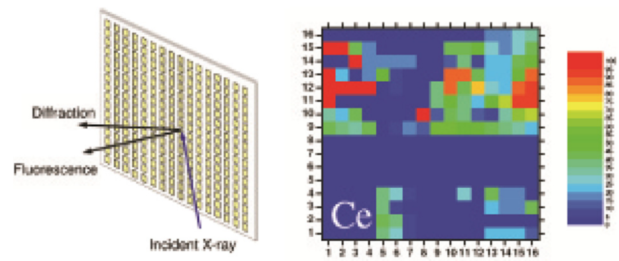
Journal of Materiomics ***2015***, 1, **85–91**

Combinatorial screening of thin film materials: An overview

Samuel S. Mao[a,*], Paul E. Burrows[b]

[a] *Department of Mechanical Engineering, University of California at Berkeley, Berkeley, CA 94720, USA*
[b] *Samuel Mao Institute of New Energy, Science Hall, Shenzhen 518031, China*

This article describes techniques of high throughput combinatorial thin film material growth and characterization developed over the past several years. Example of color-coded thin film material compositions (relative concentration of Ce) from a thin film oxide library.



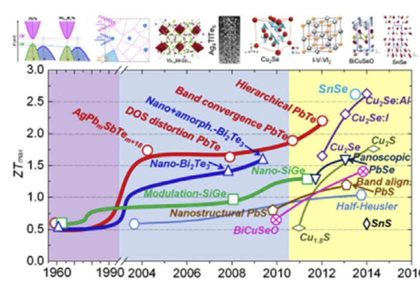
Journal of Materiomics ***2015***, 1, **92–105**

Thermoelectric materials: Energy conversion between heat and electricity

Xiao Zhang, Li-Dong Zhao*

School of Materials Science and Engineering, Beihang University, Beijing 100191, China

This review summarizes the advanced and promising thermoelectrics, involve band engineering, hierarchical architecture, and compounds with intrinsically low thermal conductivity.

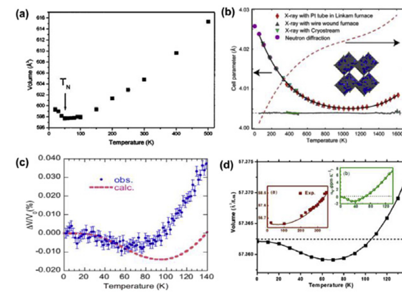


Journal of Materiomics **2015**, 1, **106−112**

Metal fluorides, a new family of negative thermal expansion materials

Lei Wang, Cong Wang*, Ying Sun, Kewen Shi, Sihao Deng, Huiqing Lu, Pengwei Hu, Xiaoyun Zhang

Center for Condensed Matter and Materials Physics, Department of Physics, Beihang University, Beijing 100191, China



Metal fluorides, as the new members of negative thermal expansion (NTE) materials, begin to draw much attention. The NTE behaviors of (a) MnF_3, (b) ScF_3, (c) ZnF_2 and (d) TiF_3 have been shown in the above figures.

Original Articles

Journal of Materiomics **2015**, 1, **113−117**

Anomalous redox properties and ultrafast chemical sensing behavior of double perovskite $CaBaCo_2O_{5+\delta}$ thin films

Haibin Wang[a,b], Erik Enriquez[a], Gregory Collins[a], Chunrui Ma[a], Ming Liu[a,c], Yamei Zhang[d], Chuang Dong[e], Chonglin Chen[a,*]

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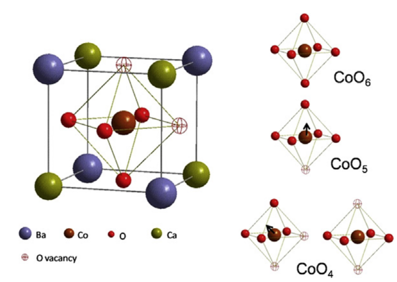
[b]*School of Material Science & Engineering, Jiangsu University of Science and Technology, Zhenjiang 212003, China*
[c]*Electronic Materials Research Laboratory, Xi'an Jiaotong University, Xi'an 710049, China*
[d]*Department of Physics, Jiangsu University of Science and Technology, Zhenjiang 212003, China*
[e]*School of Materials Science and Engineering, Dalian University of Technology, Dalian 116024, China*



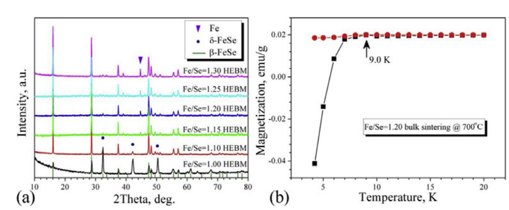
We synthesized a new perovskite oxide $CaBaCo_2O_{5+\delta}$ (CBCO) thin film on $LaAlO_3$ substrate, highlight its anomalous redox properties and ultrafast chemical sensing behavior. The CBCO thin film is very sensitive to oxidizing/reducing environments in the temperature ranges from 620 K to 970 K. Especially, the reduced CBCO thin films with Co^{2+} and high oxygen vacancy concentration have a superfast oxygen sensing response from 620 to 970 K.

Journal of Materiomics **2015**, 1, **118−123**

Optimization of FeSe superconductors with the high-energy ball milling aided sintering process

Shengnan Zhang[a,*], Jixing Liu[a,b], Jianqing Feng[a], Chengshan Li[a], Xiaobo Ma[a], Pingxiang Zhang[a]

[a]*Superconducting Materials Research Center, Northwest Institute for Nonferrous Metal Research, Xi'an, 710016, China*
[b]*School of Materials and Metallurgical, Northeast University, Shenyang, 110016, China*



We introduce the high energy ball milling aided sintering process for FeSe based superconducting bulks as a novel fabrication technique. The influences of chemical compositions and sintering temperature on both the final phase composition and superconducting properties are investigated.

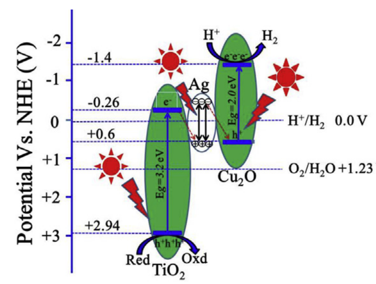
Journal of Materiomics ***2015***, 1, **124–133**

Dual Z-scheme charge transfer in TiO_2–Ag–Cu_2O composite for enhanced photocatalytic hydrogen generation

Junwei Fu[a], Shaowen Cao[a,*], Jiaguo Yu[a,b,*]

[a]*State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, 430070, China*
[b]*Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah, 21589, Saudi Arabia*

A dual Z-scheme TiO_2–Ag–Cu_2O composite nanotube photocatalyst was prepared. The prepared photocatalyst exhibits high photocatalytic H_2-production activity.



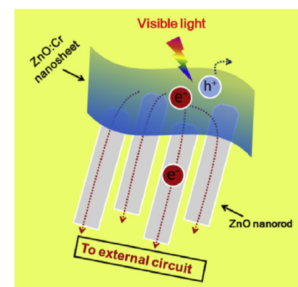
Journal of Materiomics ***2015***, 1, **134–145**

A strategy of engineering impurity distribution in metal oxide nanostructures for photoelectrochemical water splitting

Shaohua Shen[a,*], Jianan Chen[a], Li Cai[a], Feng Ren[b], Liejin Guo[a]

[a]*International Research Centre for Renewable Energy, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Shaanxi 710049, China*
[b]*School of Physics and Technology, Center for Ion Beam Application, Wuhan University, Wuhan 430072, China*

A strategy of impurity distribution engineering in metal oxide nanostructures was presented for enhanced photoelectrochemical water splitting performances in visible light.



Journal of Materiomics ***2015***, 1, **146–151**

Variation of ferroelectric hysteresis loop with temperature in $(Sr_xBa_{1-x})Nb_2O_6$ unfilled tungsten bronze ceramics

Chen Jiao Huang, Kun Li, Shu Ya Wu, Xiao Li Zhu*, Xiang Ming Chen*

Laboratory of Dielectric Materials, Department of Materials Science and Engineering, Zhejiang University, Hangzhou 310027, China

The saturated *P-E* loops are determined at low temperatures under higher electric field for $(Sr_xBa_{1-x})Nb_2O_6$ unfilled tungsten bronze ceramics.