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1. Highlights in 2007

1. Novel visible light active material $(\text{Ag}_{0.75}\text{Sr}_{0.25})(\text{Nb}_{0.75}\text{Ti}_{0.25})\text{O}_3$

A “green” chemistry process for environmental purification is realized on a novel visible-light-active photocatalyst $(\text{Ag}_{0.75}\text{Sr}_{0.25})(\text{Nb}_{0.75}\text{Ti}_{0.25})\text{O}_3$, developed by tuning band structure of AgNbO_3 - SrTiO_3 solid solution. This mixed valent solid-solution perovskite possesses a strong oxidative potential for efficient photocatalytic decomposition of acetaldehyde (CH_3CHO) – a common indoor air pollutant – at ambient temperature. The enhanced photocatalytic activity of $(\text{Ag}_{0.75}\text{Sr}_{0.25})(\text{Nb}_{0.75}\text{Ti}_{0.25})\text{O}_3$ is attributed to the modulated band structure constructed by a hybrid conduction band of the empty (Ti $3d$ + Nb $4d$) orbitals and a hybrid valence band of the occupied (O $2p$ + Ag $4d$) orbitals. The new photocatalyst is expected to find practical applications for indoor air purification by further modification of surface nano-structure (*J. Am. Chem. Soc.* **130**, 2008).

2. Novel 3D hierarchical hollow WO_3 shells and their photocatalytic properties

3-D hierarchical WO_3 hollow shells, including hollow dendrites, spheres and dumbbells, self-organized from tiny WO_3 nanoplatelets, were firstly synthesized by a simple soft chemical route. Distinguished visible-light-driven photocatalytic properties for organic pollutant decomposition were observed, attributed to the larger surface areas, higher light transmission, and much more active sites of these hierarchical hollow shells (*Adv. Funct. Mater.*, 2008).

2. Articles (original article, comment/book)

Original Paper:

1. Di Chen, **Jinhua Ye**, “Hierarchical WO_3 Hollow Shells: Dendrite, Sphere and Dumbbell and Their Photocatalytic Properties”, *Advanced Functional Materials*, in press.
2. Defa Wang, Tetsuya Kako, **Jinhua Ye**, “Efficient decomposition of acetaldehyde over a perovskite-type solid solution photocatalyst $(\text{Ag}_{0.75}\text{Sr}_{0.25})(\text{Nb}_{0.75}\text{Ti}_{0.25})\text{O}_3$ under visible light irradiation”, *J. Am. Chem. Soc.*, **130**, pp. 2724-2725, 2008.
3. Weifeng Yao, **Jinhua Ye**, “Effects of molybdenum substitution on the photocatalytic behavior of BiVO_4 ”, *Dalton Trans.*, pp.1426 – 1430, 2008.
4. Zhiguo Yi and **Jinhua Ye**, “Band gap tuning of $\text{Na}_{1-x}\text{La}_x\text{Ta}_{1-x}\text{Co}_x\text{O}_3$ solid solutions for visible light Photocatalysis”, *Applied Physics Letters*, **91**, 254108, 2007.
5. Xiukai Li, Shuxin Ouyanga, Naoki Kikugawa, **Jinhua Ye**, “Novel $\text{Ag}_2\text{ZnGeO}_4$ Photocatalyst for Dye Degradation under Visible Light Irradiation”, *Applied Catalysis A:*

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6. Weifeng Yao, **Jinhua Ye**, “A new efficient visible-light-driven photocatalyst $\text{Na}_{0.5}\text{Bi}_{1.5}\text{VMoO}_8$ for oxygen evolution”, *Chem. Phys. Lett.*, **450**, pp.370-374, 2008.
7. Tetsuya Kako, Naoki Kikugawa, **Jinhua Ye**, “Photocatalytic activity of AgSbO_3 under visible light irradiation”, *Catalysis Today*, **131**, pp.197-202, 2007.
8. Xinyi Chen, Tao Yu, Xiaoxing Fan, Haitao Zhang, Zhaosheng Li, **Jinhua Ye**, Zhigang Zou, “Enhanced activity of mesoporous Nb_2O_5 for photocatalytic hydrogen production”, *Applied Surface Science*, **253**, pp.8500-8506, 2007.
9. Di Chen, **Jinhua Ye**, “Photocatalytic H_2 evolution under visible light irradiation on AgIn_5S_8 photocatalyst” *J Phys. Chem. Solid*, **68**, pp.2317-2320, 2007
10. Tetsuya Kako, **Jinhua Ye**, “Comparison of photocatalytic activities of two kinds of lead magnesium niobate for decomposition of organic compounds under visible light irradiation”, *J. Mater. Research*, **22**, pp.2590-2597, 2007.
11. Guoqiang Li, Tetsuya Kako, Defa Wang, Zhigang Zou and **Jinhua Ye**, “Composition Dependence of the Photophysical and Photocatalytic Properties of $(\text{AgNbO}_3)_{1-x}(\text{NaNbO}_3)_x$ Solid Solutions”, *J. Solid State Chem.*, **180**, pp.2845-2850, 2007
12. Di Chen, **Jinhua Ye**, “ SrSnO_3 nanostructures: synthesis, characterization, and photocatalytic properties”, *Chem. Mater.*, **19**, pp.4585-4591, 2007.
13. B. Xu, W.F. Zhang, X.-Y. Liu, **J.H. Ye**, W.H. Zhang, L. Shi, X. G. Wan, J. Yin and Z. G. Liu, “Photophysical properties and electronic structures of the perovskite photocatalysts $\text{Ba}_3\text{NiM}_2\text{O}_9$ ($\text{M} = \text{Nb}, \text{Ta}$)”, *Physical Review B* **76**, 125109, 2007.
14. Xiukai Li, **Jinhua Ye**, “Photocatalytic Degradation of Rhodamine B over $\text{Pb}_3\text{Nb}_4\text{O}_{13}/\text{Fumed SiO}_2$ Composite under Visible Light Irradiation”, *J. Phys. Chem.C*, **111**, pp.13109-13116, 2007.
15. Junwang Tang, Zhigang Zou, **Jinhua Ye**, “Efficient Photocatalysis on BaBiO_3 Driven by Visible Light”, *J. Phys. Chem.C*, **111**, pp.12779-12785, 2007.
16. Defa Wang, **Jinhua Ye**, Hideaki Kitazawa, and Takashi Kimura, “Photophysical and photocatalytic properties of three isostructural oxide semiconductors $\text{In}_6\text{NiTi}_6\text{O}_{22}$, $\text{In}_3\text{CrTi}_2\text{O}_{10}$ and $\text{In}_{12}\text{NiCr}_2\text{Ti}_{10}\text{O}_{42}$ with different 3d transition metals”, *J. Phys. Chem. C*, **111**, pp.12848-12854, 2007.
17. Weifeng Zhang, Junwang Tang, and **Jinhua Ye**, “Structural, Photocatalytic, and Photophysical properties of perovskite MSnO_3 ($\text{M} = \text{Ca}, \text{Sr}, \text{and Ba}$) photocatalysts”, *J. Mater. Research*, **22**, pp.1859-1871, 2007.
18. Zhaosheng Li, **Jinhua Ye**, Zhigang Zou, “Photocatalytic properties of $\text{MIn}(\text{WO}_4)_2$ ($\text{M} = \text{Li}, \text{Na}, \text{and K}$)”, *Journal of Materials Research*, **22**, pp.958-964, 2007
19. Yaoming Wang, Tao Yu, Xinyi Chen, Haitao Zhang, Ouyang Shuxin, Zhaosheng Li, **Jinhua**

- Ye**, Zhigang Zou, “Enhancement of photoelectric conversion properties of SrTiO₃/α-Fe₂O₃ heterojunction photoanode”, *Journal of Physics D-Applied Physics*, **40**, pp.3925-3930, 2007
20. Wenjun Luo, Tao Yu, Yaoming Wang, Zhaosheng Li, **Jinhua Ye**, Zhigang Zou, “Enhanced photocurrent.voltage characteristics of WO₃/Fe₂O₃ nano-electrodes”, *Journal of Physics D-Applied Physics*, **40**, pp.1091-1096, 2007
21. Haitao Zhang, Lifei Liu, Zhaosheng Li, Tao Yu, **Jinhua Ye**, Zhigang Zou, “Preparation of Fe₂O₃/SrTiO₃ composite powders and their photocatalytic properties”, *Journal of Physics and Chemistry of Solids*, **68**, pp.280-283, 2007
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23. Xiukai Li, Tetsuya Kako, **Jinhua Ye**, “2-propanol Photodegradation over lead niobates under Visible Light Irradiation”, *Appl. Catal. A: Gen.*, **326**, Issue 1, pp. 1-7, 2007.
24. Zhen-Yan Deng, Jose M. F. Ferreira, Yoshihisa Tanaka and **Jinhua Ye**, “Physicochemical Mechanism for the Continuous Reaction of γ-Al₂O₃-Modified Aluminum Power with Water“, *J Am Ceram. Soc.*, **90**[5], pp.1521-1526, 2007.
25. Tetsuya Kako, Zhigang Zou, Masahiko Katakiri, **Jinhua Ye**, “Decomposition of Organic Compounds over NaBiO₃ under Visible Light Irradiation”, *Chem. Mater.*, **19**(2), pp.198-202, 2007.
26. Tetsuya Kako, **Jinhua Ye**, “Photo-induced amphiphilic property of InNbO₄ thin film”, *Langmuir*, **23** (4), pp. 1924-1927, 2007.
27. Junwang Tang, Hengdo Qua, **Jinhua Ye**, “Photocatalytic properties and photoinduced hydrophilicity of surface-fluorinated TiO₂”, *Chem. Mater.*, **19**(1), pp.116-122, 2007.

3. Presentation in international/domestic conferences (Invited)

Jinhua YE, “Perspective of Novel Photocatalytic Material”, Global Market for Photocatalysis, Japan, Tokyo Big site. Oct. 17-19, 2007.

4. Others

none