

XIAOQING HE

Electron Microscopy Core Facility

University of Missouri-Columbia

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EDUCATION

- 2012 Ph.D. Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences
Supervisor: Prof. Xiaofeng Duan
- 2009 Master Department of Materials Science and Engineering, Hubei University
Supervisor: Prof. Chaojing Lu
- 2006 Bachelor Electronic Science and Technology, Hubei University

PROFESSIONAL EXPERIENCE

2016. 06-present Senior research specialist, Electron microscopy core at University of Missouri-Columbia.
2013. 08-2016. 05 Postdoc research associate, University of Illinois at Urbana-Champaign.
In close collaboration with NCEM, University of Illinois at Chicago, Arizona State University
Supervisor: Prof. Angus Rockett
2012. 07-2013. 07 Research scientist, Institute of Geology and Geophysics, Chinese Academy of Sciences.

SKILLS AND ABILITIES

- Proficient in operation of various transmission electron microscopes (TEM), including: FEI CM 12, FEI CM 200, FEI Tecnai F20, FEI Titan ChemiSTEM™, JEM-2010, JEM-2010F, JEM-2200FS, JEM-ARM 200CF.
- Have a rich experience of maintaining TEM and sample preparation, including traditional grinding, polishing, ion milling as well as focused ion beam (FEI Nanolab Helios 600i) lift-out prep.
- Have a profound understanding of transmission electron microscopy (TEM): Electron diffraction (SAED, CBED), Bright field (BF) and Dark field (DF) imaging, High-resolution TEM, Scanning transmission electron microscopy (STEM), Electron energy loss spectroscopy (EELS), Energy dispersive X-ray spectroscopy (EDX), Energy-filtered TEM, STEM-EELS, STEM-EDX, Spectrum-image, image and diffraction pattern simulation.

RESEARCH INTERESTS

Defects analysis, thin film solar cells, lithium ion cathode/anode materials and transmission electron microscopy and spectroscopy

PUBLICATIONS

1. **X. Q. He**, C. Wen, X. F. Duan, H. Chen
Identification of atomic steps at AlSb/GaAs hetero-epitaxial interface using geometric phase method by high-resolution electron microscopy
Materials Letters vol. 65, pp. 456–459, 2011
2. **Xiaoqing He**, Lin Gu, Changbao Zhu, Yan Yu, Chilin Li, YongSheng Hu, Hong Li, Susumu Tsukimoto, Joachim Maier, Yuichi Ikuhara, and Xiaofeng Duan
Direct imaging of Lithium Ions Using Aberration-Corrected Annular-Bright-Field Scanning Transmission Electron Microscopy and Associated Contrast Mechanisms
Materials Express, vol. 1, pp. 43-50, 2011
3. **X. Q. He**, G. Brown, K. Demirkan, N. Mackie, V. Lordi, and A. Rockett
Microstructural and Chemical Investigation of PVD-CdS/PVD-CuIn_{1-x}Ga_xSe₂ Heterojunctions: A Transmission Electron Microscopy Study
IEEE Journal of Photovoltaics, vol. 4, pp. 1625-1629, 2014
4. **Xiaoqing He**, Joel Varley, Peter Ercius, Thomson Erikson, Jeff Bailey, Geordie Zapalac, Dmitry Poplavskyy, Neil Mackie, Atiye Bayman, Vincenzo Lordi and Angus Rockett
Intermixing and formation of Cu-rich secondary phases at sputtered CdS/CuInGaSe₂ heterojunctions
IEEE Journal of Photovoltaics, accepted.
5. Kejun Zhang*, Haibo Wang*, **Xiaoqing He***, Zhihong Liu, Li Wang, Lin Gu, Hongxia Xu, Pengxian Han, Shanmu Dong, Chuanjian Zhang Jianhua Yao, Guanglei Cui and Liquan Chen
A hybrid material of vanadium nitride and nitrogen-doped graphene for lithium storage
(* contribute equally)
Journal of Materials Chemistry, vol. 21, pp. 11916-11922, 2011
6. Xia Lu, Liang Zhao, **Xiaoqing He**, Ruijuan Xiao, Lin Gu, Yong-Sheng Hu, Hong Li, Zhaoxiang Wang, Xiaofeng Duan, Liquan Chen, Joachim Maier and Yuichi Ikuhara
Li-storage in Li₄Ti₅O₁₂ spinel: The full static picture from Electron Microscopy
Advanced Materials, vol. 24, pp. 3233–3238, 2012
7. X. Lu, Y. Sun, Z. Jian, **X. He**, L. Gu, Y.-S. Hu, H. Li, Z. Wang, W. Chen, and X. Duan

- New Insight into the Atomic Structure of Electrochemically Delithiated $\text{O}_3\text{-Li}_{(1-x)}\text{CoO}_2$ ($0 \leq x \leq 0.5$) Nanoparticles
Nano Letters, vol. 12, pp. 6192-6197, 2012
8. Yong-Qing Wang, Lin Gu, Yu-Guo Guo, Hong Li, **Xiao-Qing He**, Susumu Tsukimoto, Yuichi Ikuhara and Li-Jun Wan
Rutile- TiO_2 Nanocoating for High-Rate $\text{Li}_4\text{Ti}_5\text{O}_{12}$ Anode of Lithium-Ion Battery
Journal of American Chemical Society, vol. 134, pp. 7874–7879, 2012.
 9. R. Wang, **X. He**, L. He, F. Wang, R. Xiao, L. Gu, H. Li, and L. Chen
Atomic Structure of Li_2MnO_3 after Partial Delithiation and Re-Lithiation
Advanced Energy Materials, vol. 3, pp. 1358-1367, 2013.
 10. C. Cao, X. Wang, Y. Cai, L. Sun, L. Tian, H. Wu, **X. He**, H. Lei, W. Liu, and G. Chen, R. Zhu and Y. Pan
Targeted In Vivo Imaging of Microscopic Tumors with Ferritin-based Nanoprobes Across Biological Barriers
Advanced Materials, vol. 26, pp. 2566-2571, 2014.
 11. Yao Cai, Changqian Cao, **Xiaoqing He**, Caiyun Yang, Lanxiang Tian, Rixiang Zhu, Yongxin Pan
Enhanced magnetic resonance imaging and staining of cancer cells using ferrimagnetic H-ferritin nanoparticles with increasing core size
International Journal of Nanomedicine, vol. 10, pp. 2619-2634, 2015.
 12. Shanming Li, Qingqing Gao, Jingbo Li, **Xiaoqing He**, Qinghua Zhang, Chao Li, Yang Shen, Lin Gu, Yuan Yao, Yanguo Wang, Richeng Yu, Xiaofeng Duan, and Yuichi Ikuhara
Revealing Antiphase Boundaries and Defects at Atomic Resolution in NaLaMgWO_6 Double Perovskites
Materials Express, vol. 2, pp. 51-56, 2012.
 13. B. Qi, Y. Yu, **X. He**, L. Wu, X. Duan, and J. Zhi
Series of transition metal-doped TiO_2 transparent aqueous sols with visible-light response
Materials Chemistry and Physics, vol. 135, pp. 549-553, 2012.
 14. Z. Wang, Y. Yao, **X. He**, Y. Yang, L. Gu, Y. Wang, and X. Duan
Investigation of Strain and Thin Film Relaxation in $\text{Ge}_x\text{Si}_{1-x}/\text{Si}$ Strained-Layer Superlattice by Dark-Field Electron Holography
Materials Transactions, vol. 53, pp. 2019-2022, 2012.
 15. Kun Liang, **Xiaoqing He**, Yajun Qi, Chaojing Lu
Growth and ferroelectric properties of $\text{Bi}_{4-x}\text{Nd}_x\text{Ti}_3\text{O}_{12}$ single crystals

Journal of Crystal Growth, vol. 310, pp. 2471-2475, 2008

16. Zuhuang Chen, Jian Liu, Yajun Qi, Deyang Chen, Shang-Lin Hsu, Anoop R. Damodaran, **Xiaoqing He**, Alpha T. N'Diaye, Angus Rockett, and Lane W. Martin
180 degrees Ferroelectric Stripe Nanodomains in BiFeO₃ Thin Films
Nano letters, vol. 15, pp. 6506-6513, 2015.
17. J. Varley, V. Lordi, **X. He**, and A. Rockett
First principles calculations of point defect diffusion in CdS buffer layers: Implications for Cu (In, Ga)(Se, S)₂ and Cu₂ZnSn (Se, S)₄-based thin-film photovoltaics
Journal of Applied Physics, vol. 119, p. 025703, 2016.

CONTRIBUTED PRESENTATIONS AND PROCEEDINGS

1. Microstructural and chemical investigation of PVD-CdS/ PVD-CuIn_{1-x}Ga_xSe₂ heterojunctions: a transmission electron microscopy study, the 40th IEEE Photovoltaic Specialists Conference, Denver, Colorado, June, 2014. (oral presentation)
2. Cu rich domains and second phase in PVD-CdS/ PVD-CuIn_{1-x}Ga_xSe₂ heterojunctions, the 42nd IEEE Photovoltaic Specialists Conference, New Orleans, Louisiana, June, 2015. (oral presentation)
3. Exploring Cd-Zn-O-S alloys for optimal buffer layers in thin-film photovoltaics, APS March Meeting 2015.
4. Cd-Zn-O-S alloys for optimal buffer layers in thin-film photovoltaics, *Proc. SPIE* 9561, Thin Films for Solar and Energy Technology VII, 95610A (October 5, 2015);

JOURNAL REFEREE

IEEE Journal of Photovoltaics

Journal of Alloys and Compounds

Chinese Physics B

Materials Express

Thin solid films