

**Youjun He**  
Post. Doc Researcher  
Center For Nanophase Materials Sciences Division  
Oak Ridge National Laboratory  
(310) 600-6450  
Hey2@ornl.gov



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### Education

Institute of Chemistry, Chinese Academy of Sciences Ph.D. degree in Physical Chemistry. 2007, 09-2010,07  
University of Science and Technology Beijing Master degree in Analytical Chemistry. 2004, 09-2007, 07  
University of Science and Technology Beijing Bachelor degree in Applied Chemistry. 2000, 09-2004, 07

### Professional Experience

2012, 01- Oak Ridge National Laboratory, Oak Ridge, Tennessee Post. Doc Researcher  
2010, 08-2011, 12 University of California, Los Angeles Post. Doc Researcher

### Honors and awards

2001 People's Scholarship.  
2002 National Prize Scholarship.  
2003 & 2004 Merit Student of USTB (two times).  
2004 Excellent Graduate of USTB.  
2006 Merit Graduate Student of USTB.  
2007 Merit Student of CAS.

### Research Synopsis

#### 1. *Conjugated Polymer Donor Materials for Polymeric Solar Cell Applications*

We design and synthesis some novel conjugated polymer materials with low band gaps, high hole mobility and suitable energy levels, test their photovoltaic performance, and investigate the relationship between materials structure and their optical and electric properties.

#### 2. *Fullerene Acceptor Materials for Polymeric Solar Cell Applications*

We design and synthesis some novel fullerene materials with good solubility, high electron mobility and high energy levels, test their photovoltaic performance, and investigate the relationship between materials structure and properties.

#### 3. *Small Molecular Donor Materials for Polymeric Solar Cell Applications*

We design and synthesis some novel small molecular materials with low band gaps, good solubility, high hole mobility and suitable energy levels, test their photovoltaic performance, and investigate the relationship between materials structure and their optical and electric properties.

#### 4. *Conjugated Polymers for Fundamental Research*

We also design and synthesis some novel conjugated polymers, investigate their assembly and morphology under different conditions. and also investigate the influence of their structure on above properties.

### Publication list:

1. Youjun He, Bo Peng, Guangjin Zhao, Yingping Zou, Yongfang Li\*, "Indene addition of [6, 6]-phenyl-C<sub>61</sub>-butyric acid methyl ester for high performance acceptor in polymer solar cells", *J. Phys. Chem. C* 2011, *115*, 4340-4344.
2. Youjun He, Yongfang Li\*, "Fullerene derivative acceptors for high performance polymer solar cells", *Phys. Chem. Chem. Phys* 2011, *13*, 1970-1983.
3. Youjun He, Hsiang-Yu Chen, Guangjin Zhao, Jianhui Hou\*, and Yongfang Li\*, "Biindene-C<sub>60</sub> adducts for the application as acceptor in polymer solar cells with higher open-circuit-voltage", *Sol. Energy Mater. Sol. Cells* 2011, *95*, 899-903.
4. Youjun He, Hsiang-Yu Chen, Guangjin Zhao, Jianhui Hou\*, Yongfang Li\*, "Synthesis and photovoltaic

- properties of biindene-C<sub>70</sub> monoadduct as acceptor in polymer solar cells”, *Sol. Energy Mater. Sol. Cells* 2011, 95, 1762-1766.
5. Youjun He, Hsiang-Yu Chen, Jianhui Hou\*, Yongfang Li\*, “Indene-C<sub>60</sub> bisadduct: a new acceptor for high performance polymer solar cells”, *J. Am. Chem. Soc* 2010, 132, 1377-1382.
  6. Youjun He, Guangjin Zhao, Bo Peng, Yongfang Li\*, “High yield synthesis, electrochemical and photovoltaic properties of indene-C<sub>70</sub> bisadduct”, *Adv. Funct. Mater* 2010, 20, 3383-3389.
  7. Youjun He, Guangjin Zhao, Maojie Zhang, Jie Min, Yongfang Li\*, “Poly(dithienosilole vinylene): a low bandgap conjugated polymer”, *Synth. Met* 2010, 160, 1045-1049.
  8. Youjun He, Jianhui Hou, Zhan’ao Tan, Yongfang Li\*, “Synthesis and photovoltaic properties of polythiophene derivatives with side chains containing C<sub>60</sub> end group”, *J. Appl. Polym. Sci.* 2010, 115, 532-539.
  9. Youjun He, Yi Zhou\*, Guangjin Zhao, Jie Min, Xia Guo, Bo Zhang, Maojie Zhang, Jing Zhang, Yongfang Li\*, Fengling Zhang, Olle Inganäs, “Poly(4,8-bis(2-ethylhexyloxy)benzo[1,2-b:4,5-b'] dithiophene vinylene): Synthesis, Optical and Photovoltaic Properties”, *J. Polym. Sci. A: Polym. Chem.* 2010, 48, 1822-1829.
  10. Youjun He, Weiping Wu, Yunqi Liu\*, Yongfang Li\*, “High performance polymer field-effect transistors based on polythiophene derivative with conjugated side chain”, *J. Polym. Sci. A: Polym. Chem* 2009, 47, 5304-5312.
  11. Youjun He, Maojie Zhang, Jie Min, Guangjin Zhao, Yongfang Li\*, "Influence of sulfur oxidation on the absorption and electronic energy levels of poly (thienothiophene) derivatives", *J. Phys. Chem. B* 2009, 113, 14981-14985.
  12. Youjun He, Weiping Wu, Guangjin Zhao, Yunqi Liu\*, Yongfang Li\*, “Poly (3, 6-dihexyl-thieno [3, 2-b] thiophene vinylene): Synthesis, Field-Effect Transistors and Photovoltaic Properties”, *Macromolecules* 2008, 41, 9760-9766.
  13. Youjun He, Xiang Wang, Jing Zhang, Yongfang Li\*, “Low Bandgap Polymers by Copolymerization of Thiophene with Benzothiadiazole”, *Macromol. Rapid Commun* 2009, 30, 45-51.
  14. Youjun He, Guangjin Zhao, Jie Min, Maojie Zhang, Yongfang Li\*, “Poly(thienylene-benzothiadiazole-thienylene vinylene): a narrow bandgap polymer with broad absorption from visible to infrared region”, *Polymer* 2009, 50, 5055-5058.
  15. Youjun He, Yongfang Li\*, “Research progress of polymer solar cells photovoltaic materials”, *Chemistry Progress*, 2009, 21, 2303-2318.
  16. Guangjin Zhao, Youjun He, Chang He, Haijun Fan, Yun Zhao, Yongfang Li\*, “Photovoltaic Properties of Poly (benzothiadiazole-thiophene-co-bithiophene) as Donor in Polymer Solar Cells”, *Sol. Energy Mater. Sol. Cells* 2011, 95, 704-711.
  17. Guangjin Zhao, Youjun He, Yongfang Li\*, “6.5% Efficiency of the polymer solar cells based on poly (3-hexylthiophene) and indene-C<sub>60</sub> bisadduct by device optimization”, *Adv. Mater* 2010, 22, 4355-4358.
  18. Guangjin Zhao, Youjun He, Zheng Xu, Jianhui Hou\*, Maojie Zhang, Jie Min, Hsiang-Yu Chen, Mingfu Ye, Ziruo Hong, Yang Yang\*, Yongfang Li\*, “Effect of carbon chain length in the substituent of PCBM-like molecules on their photovoltaic properties” , *Adv. Funct. Mater* 2010, 20, 1480-1487.
  19. Jing Zhang, Dan Deng, Chang He\*, Youjun He, Maojie Zhang, Zhi-Guo Zhang, Zhanjun Zhang, Yongfang Li\*, “Star-Shaped Molecules with Triphenylamine core and Dicyanovinyl End-groups for Organic Solar Cells”, *Chem. Mater* 2011, 23, 817-822.
  20. Yen-Ju Cheng\*, Chao-Hsiang Hsieh, Youjun He, Chain-Shu Hsu\*, Yongfang Li\*, “Combination of indene-C<sub>60</sub> bis-adduct and cross-linked fullerene interlayer leading to highly efficient inverted polymer solar cells”, *J. Am. Chem. Soc* 2010, 132, 17381-17383.
  21. Xiaochen Wang, Haiqiao Wang, Yi Yang, Youjun He, Lei Zhang, Yongfang Li\* and Xiaoyu Li\*, “Zinc tetraphenylporphyrin-Fluorene Branched Copolymers: Synthesis and Light-Emitting Properties”, *Macromolecules* 2010, 43, 709-715.
  22. Maojie Zhang, Haijun Fan, Xia Guo, Youjun He, Zhiguo Zhang, Jie Min, Jing Zhang, Xiaowei Zhan\* and Yongfang Li\*, “Synthesis and photovoltaic properties of bithiazole-based donor-acceptor copolymers”, *Macromolecules* 2010, 43, 5706-5712.
  23. Maojie Zhang, Haijun Fan, Xia Guo, Youjun He, Zhi-Guo Zhang, Jie Min, Jing Zhang, Xiaowei Zhan and Yongfang Li\*, “Synthesis and photovoltaic properties of a copolymer of benzodithiophene and

bithiazole”, *Macromolecules* 2010, 43, 8714-8717.

### **Patents application**

- (1) Youjun He, Yongfang Li, “One kind of conjugated polymers with thieno[3,2-b]thiophene vinylene unit in the main chain, its synthesis method and application”, Patent Application Number: CN200810106418.5, Patent Application Date: 04/18/2008.
- (2) Youjun He, Guangjin Zhao, Jie Min, Maojie Zhang, Yongfang Li, “One kind of fullerene acceptor derivatives, its synthesis methods and application ”, Patent Application Number: CN200910085130.9, Patent Application Date, 02/06/2009.
- (3) Youjun He, Guangjin Zhao, Maojie Zhang, Jie Min, Yongfang Li, “One kind of fullerene acceptor materials with indene unit, its synthesis methods and application”, Patent Application Number: CN200910086711.4, Patent Application Date, 06/19/2009.
- (4) Youjun He, Guangjin Zhao, Yongfang Li, “One kind of fullerene derivative acceptor materials with indene unit, its synthesis methods and application”, Patent Application Number: CN200910237889.4, Patent Application Date, 11/20/2009.