

Engineering graphene/carbon towards energy storage and conversion

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Alarmed by global warming and the energy crisis, intensive efforts have been devoted to developing sustainable energy technologies/resources. Carbon/graphene have attracted tremendous attentions because of its physical and chemical properties, especially after Nobel Prize was awarded to Andre Geim and Konstantin Novoselov. Recently, it was found that engineering/tailoring graphene could tune its capability in energy storage and conversion devices/systems. In this talk, we will show how to tailor graphene/graphene oxide to achieve high-performance Li-ion batteries.[1-2] A green strategy to collect microporous carbon from disposable sugarcane waste for lithium ion battery (LIB) applications will be involved as a typical case.[3] Besides, a universal method to engineer metal-oxide metal-carbon interface for low-cost high-efficiency ultrastable oxygen reduction will also be introduced.[4] Moreover, some basic understanding of electronic properties tuning and interface engineering will be unveiled with the assistance of scanning tunneling microscopy (STM) and density functional theory (DFT) calculations.[5]

References:

- [1] **C.D. Wang**, Y.S. Lee, J.J. Jiang, W.-H. Chiang, ACS Appl. Mater. Interf. **7**, 17441 (2015).
- [2] H.B. Jiang, Y. Liu, Y. Zhang, X.Y. Fu, D.D. Han, Y.L. Zhang, Z.R. Hong, **C.D. Wang**, H.B. Sun, Sci Rep **5**, 17522 (2015).
- [3] **C.D. Wang**, M.H. Lan, Y. Zhang, H.D. Bian, M.K. Yuen, K. Ostrikov, J.J. Jiang, W.J. Zhang, Y.Y. Li, J. Lu, Green Chem. **18**, 3029 (2016).
- [4] **C.D. Wang**, Y. Zhang, Y. Li, J.B. Liu, Q.-H. Wu, J.J. Jiang, Y.Y. Li, J. Lu, Nanotechnology **28**, 065401 (2017).
- [5] L. Lv, D.-C. Zha, Y.J. Ruan, Z.S. Li, X. Ao, J.J. Jiang, J. Chen, **C.D. Wang**, Submitted (2017)

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