Yuting Luo

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Education

- Bachelor of Science, Chemistry, Nankai University, Tianjin China (09/2010-06/2014)
- Pursuing the Ph. D, Chemistry, Texas A&M University (09/2015-now)

Publication

- **Yuting Luo**,† Xianlong Zhou,† Yiren Zhong, Mei Yang, Jinping Wei, and Zhen Zhou*, Preparation of core-shell porous magnetite@carbon nanospheres through chemical vapor deposition as anode materials for lithium-ion batteries, ***Electrochimica Acta*** 2014, 154, 136-141.
- Yiren Zhong, Mei Yang, Xianlong Zhou, **Yuting Luo**, Jinping Wei, and Zhen Zhou*, Orderly-Packed Anodes for High-Power Lithium-Ion Batteries with Super Long Cycle Life: Rational Design of $MnCO_3$/Large-Area Graphene Composites, ***Advanced Materials*** 2015, 27(5), 806-812.
- Lin Mei, Zhentan Lu, Wei Zhang, Zhongming Wu, Xinge Zhang*, Yanan Wang, **Yuting Luo**, Chaoxing Li*, Yanxia Jia, Bioconjugated nanoparticles for attachment and penetration into pathogenic bacteria, ***Biomaterials*** 2013, 34, 10328-10337.

Research Experience

Inorganic materials for energy storage (Jun. 2013-present)

Research Assistant in Nanostructured Functional Material Laboratory Institute of New Energy Material Chemistry, Nankai University Advisor: Prof. Zhen Zhou

Preparation of core-shell porous magnetite@carbon nanospheres through chemical vapor deposition as anode materials for lithium-ion batteries

- Chemical vapor deposition (CVD) is a facile method for synthesizing Fe_3O_4@C well-dispersed nanospheres in terms of timesaving procedures and coating carbon layer.
- The carbon layer which is three-dimensional (3D) core-shell networked-like structure serves as a highly conducting framework and provides with a flexible space for buffering strain and stress.
- The magnetite@carbon composites exhibit high reversible capacity (~1100 mAh g^{-1} at 100 mA g^{-1} after 60 cycles), excellent cyclic stability and good rate performance.

Rational design of Fe_2O_3-SnO_2@C ternary hybrid structure with improved lithium storage performance

- There is a rational design of different hybrid structured materials (Fe_2O_3-SnO_2-C and Fe_2O_3-SnO_2@C).
- The exploration of novel method (electrospinning method) compared with traditional method (hydrothermal method).
- The Fe_2O_3-SnO_2@C presents better electrochemical performance than the Fe_2O_3-SnO_2-C since the carbon layer of the former material is able to alleviate the expansion of metal oxides and improve the electrochemical conductivity.

Orderly-packed anodes for high-power lithium-ion batteries with super long cycle life: rational design of $MnCO_3$/large-area graphene composites

- There is a delicately-designed architecture that large-area graphene offers perfect large-area support for $MnCO_3$ particles with uniform dispersion, allowing the inter-separated spaces for accommodation of structural re-organization during cycling.
- Continuous graphene networks guarantee outstanding ion diffusion and electronic conduction, readily yielding high power delivery, meanwhile, the inter-plane compact configuration of graphene domains furnishes sustained structural stability and high packing energy storage.
- The desirable electrodes achieved high capacity, superior power delivery and excellent

cyclic stability.

Temperature control synthesis of porous $NiCo_2O_4$ nanosheets as anode materials for lithium-ion battery

- Facile synthesis of $NiCo_2O_4$ porous nanosheets without specific additions under different temperatures.
- Porous organized nanosheets which are able to alleviate the strain during the charge-discharge process and accelerate transfer of electrons and lithium ions.
- The active material which synthesized in optimal temperature (400 ^oC) exhibits excellent performance and superior cycling stability (~1100 mAh g^{-1} at 100 mA g^{-1} after 50 cycles).

Facile synthesis of Fe_2O_3@C hollow-structured fibers for sodium-ion battery

- Sodium-ion battery is gradually prevailing due to abundant distribution geologically.
- The diameter of sodium ion is larger than the lithium ion, so the facile method of electrospinning is utilized to fabricate controllable hollow-structured fibers which facilitate the transfer for the sodium ion and electrons.
- The hollow-structured Fe_2O_3@C fibers show excellent rate performance because of the large surface area which provides with active sites.

Academic skills

- Rational design of novel nanostructured materials for excellent performances as anode for lithium-ion battery or sodium-ion battery.
- Synthesis of active materials by hydrothermal method and electrospinning method.
- Characterized materials by XRD, XPS, Raman, SEM, TEM, TG, BET, CV, EIS tests.
- Battery assembly of lithium-ion battery, sodium-ion battery used for electrochemical tests.

Scholarship & Awards

- National Encouragement scholarship (Top 10% of Chemistry department in Nankai University) (2013)
- Feiyang fellowship (For recognition of student achieved the most improvement) (2013)
- Merit student of Nankai University –Excellent undergraduate researcher (2013)
- The Third Prize Scholarship in Nankai University (2012)