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(Huaxue Xuebao)

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研究评论

综述

研究论文

* 通信联系人.

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Vol. 76, No. 9 September 15, 2018

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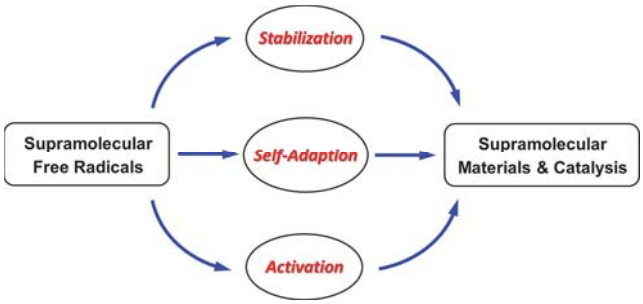
On the cover: In order to enrich surface functional groups of pristine $Ti_3C_2T_x$ nanomaterial, accordion-like PANI/$Ti_3C_2T_x$ composites were successfully synthesized via *in situ* polymerization method and applied in removal of U(VI) from aqueous solution effectively. [Wang, Xiangke *et al.* on page 701-708.]

Account

Supramolecular Free Radicals: Fabrication, Modulation and Functions



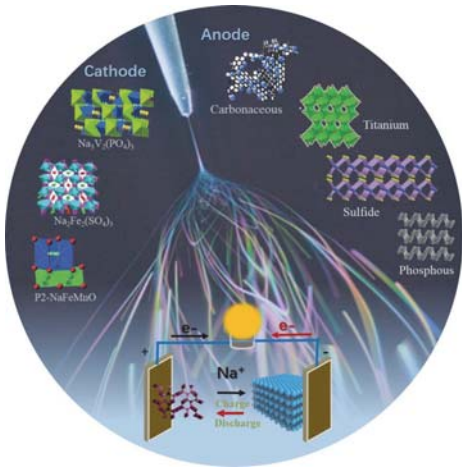
This account summarizes our recent research on the construction and functions of supramolecular free radicals. Through the host-guest chemistry of cucurbiturils, free radicals can be stabilized, activated or endowed with adaptive reactivity. These supramolecular free radicals exhibit diverse applications on supramolecular materials and supramolecular catalysis.

Jiao, Yang; Zhang, Xi*

Acta Chim. Sinica **2018**, *76*(9), 659-665

Review

Research Progress on Electrospun Materials for Sodium-Ion Batteries

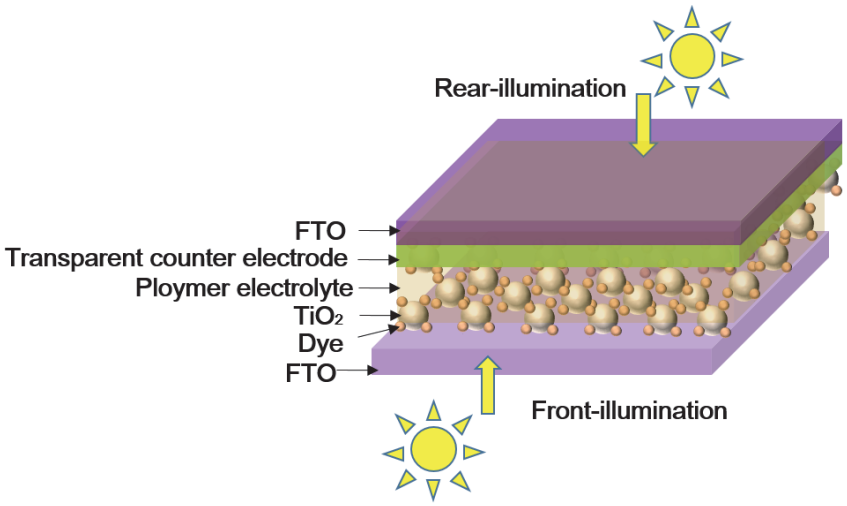


The abundance reserves and low cost of sodium make sodium-ion batteries one of the ideal options for the next large-scale energy storage system. Materials prepared by electrospinning has been widely applied in secondary batteries. The research progress on electrospinning materials for sodium-ion batteries, including cathode materials and anode materials were summarized. The future development of electrospinning materials for sodium ion batteries is also prospected.

Wang, Ling; Yang, Guorui; Wang, Jianan; Wang, Silan; Peng, Shengjie; Yan, Wei*

Acta Chim. Sinica **2018**, *76*(9), 666-680

Research Progress of Bifacial Solar Cells with Transparent Counter Electrode



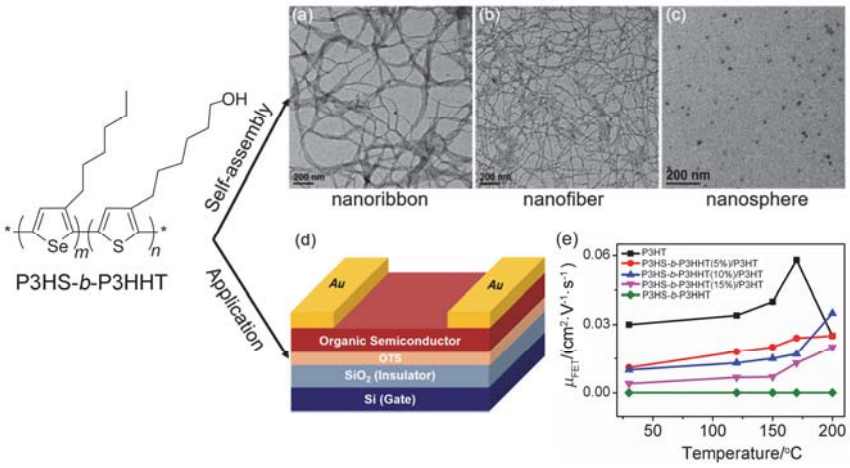
Yang, Ying; Chen, Tian; Pan, Dequn; Zhang, Zheng; Guo, Xueyi*

Acta Chim. Sinica **2018**, *76*(9), 681-690

Bifacial solar cells with transparent counter electrode can realize the purpose that sunlight can pass through the photoanode and the transparent counter electrode at the same time, which can greatly broad the light utilization of device to achieve improved optoelectronic performance. In this paper, the transparent counter electrodes of bifacial DSSCs (dye-sensitized solar cells), QDSCs (quantum dots sensitized solar cells) and PSCs (perovskite solar cells) are comprehensively discussed. The influence of materials choosing (alloys, sulfides, selenides, and conductive polymers) and interfacial modification methods of transparent counter electrode on the photovoltaic performances of bifacial devices are analyzed.

Article

Synthesis and Properties of an All-Conjugated Polythiophene-Polyselenophene Diblock Copolymer

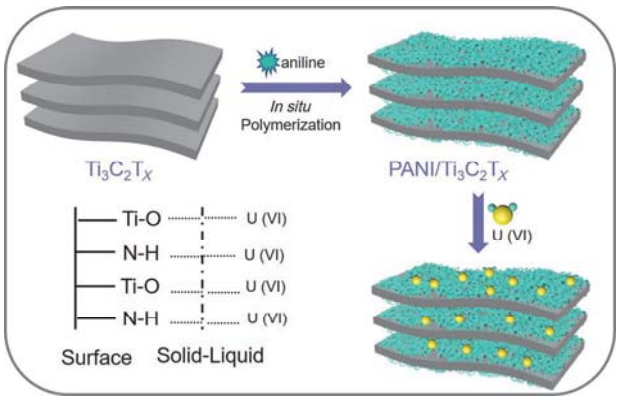


Cui, Huina; Qiu, Feng; Peng, Juan*

Acta Chim. Sinica **2018**, *76*(9), 691-700

All-conjugated poly(3-hexylselenophene)-*b*-poly[3-(6-hydroxyl)hexylthiophene] (P3HS-*b*-P3HHT) with hydroxyl groups as side substitution groups was synthesized *via* the Grignard metathesis (GRIM) method. On one hand, P3HS-*b*-P3HHT self-assembled into diverse nanostructures, such as nanoribbons, nanofibers and nanospheres in mixed solvents. On the other hand, based on the thermal cross-linkable properties of hydroxyl groups, P3HS-*b*-P3HHT was mixed with P3HT homopolymer to fabricate the P3HS-*b*-P3HHT/P3HT OFETs with improved thermal stability.

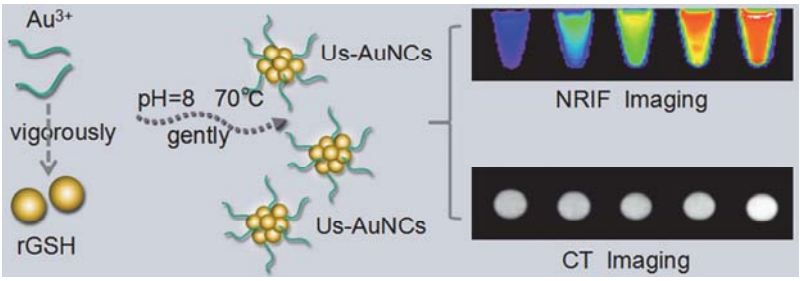
Enrichment of U(VI) on Polyaniline Modified Mxene Composites Studied by Batch Experiment and Mechanism Investigation



Gu, Pengcheng; Song, Shuang; Zhang, Sai; Wei, Benben; Wen, Tao; Wang, Xiangke*

Acta Chim. Sinica **2018**, *76*(9), 701-708

Study of Fluorescence and CT Bimodal Imaging of Ultrasmall Gold Nanoclusters

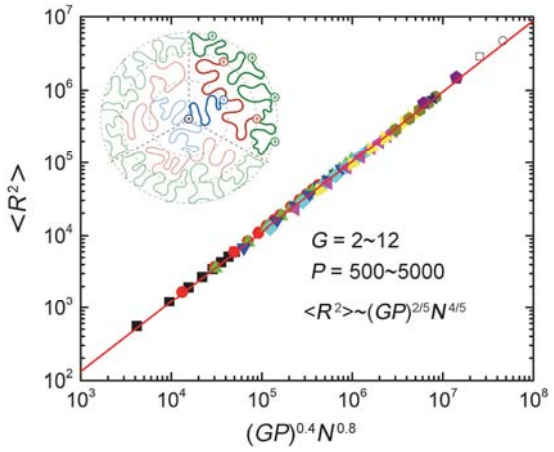


Zhang, Yanyan; Wu, Minghao; Wu, Mingjie; Guo, Linpei; Cao, Lin; Wu, Hongyi; Zhang, Xuening*

Acta Chim. Sinica **2018**, *76*(9), 709-714

Relying on rGSH as reductant and stabilizer, a simultaneous enhancement of fluorescence and CT imaging of subnanometer ultrasmall AuNCs (Us-Au_{15}NCs) is realized by simply adjusting the pH and tuning the mole ratio of Au and GSH in the synthetic precursors, which prompts Au^{3+} with the specific reductive and alkaline environment to form more accurate atomic number, superior to the traditional method which only emphasized fluorescence imaging of AuNCs.

Self-Consistent Field Theory Studies of Flexible Dendrimer in Good Solvent

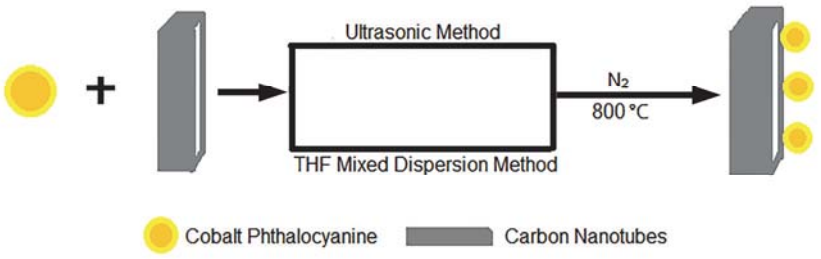


Shi, Meng; Yang, Yingzi*; Qiu, Feng

Acta Chim. Sinica **2018**, *76*(9), 715-722

The self-consistent field theory combined with a pre-averaged excluded volume potential is employed to study the conformation and scaling behavior of a dendrimer in athermal solvent. The scaling law is found to be $R\sim(GP)^{1/5}N^{2/5}$. The result agrees with the prediction by the Flory mean field theory based on the full molecule.

Effect of Nitrogen-Containing Functional Groups of Cobalt Phthalocyanine Catalyst on the Oxygen Reduction Performance in Fuel Cells



Huang, Wenjiao; Zhang, Haoyu; Hu, Shuozhen; Niu, Dongfang*; Zhang, Xinsheng*

Acta Chim. Sinica **2018**, *76*(9), 723-728

Two heat-treated cobalt phthalocyanine catalysts supported on carbon nanotubes respectively named CoPc-CNT-S and CoPc-CNT-R are synthesized with ultrasonic method and tetrahydrofuran-mixed dispersion method. In comparsion with CoPc-CNT-R, CoPc-CNT-S has more pyrrole nitrogen on the surface. The fuel cell tests in a PEM/AEM hybrid fuel cell showed that the activity and stability of CoPc-CNT-S performed better than CoPc-CNT-R. These observations may result from the cooperative effect from the similar ratio of pyridinic and pyrrolic nitrogen which may accelerate the catalytic activity of CoPc-CNT-S toward oxygen reduction reaction.

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