



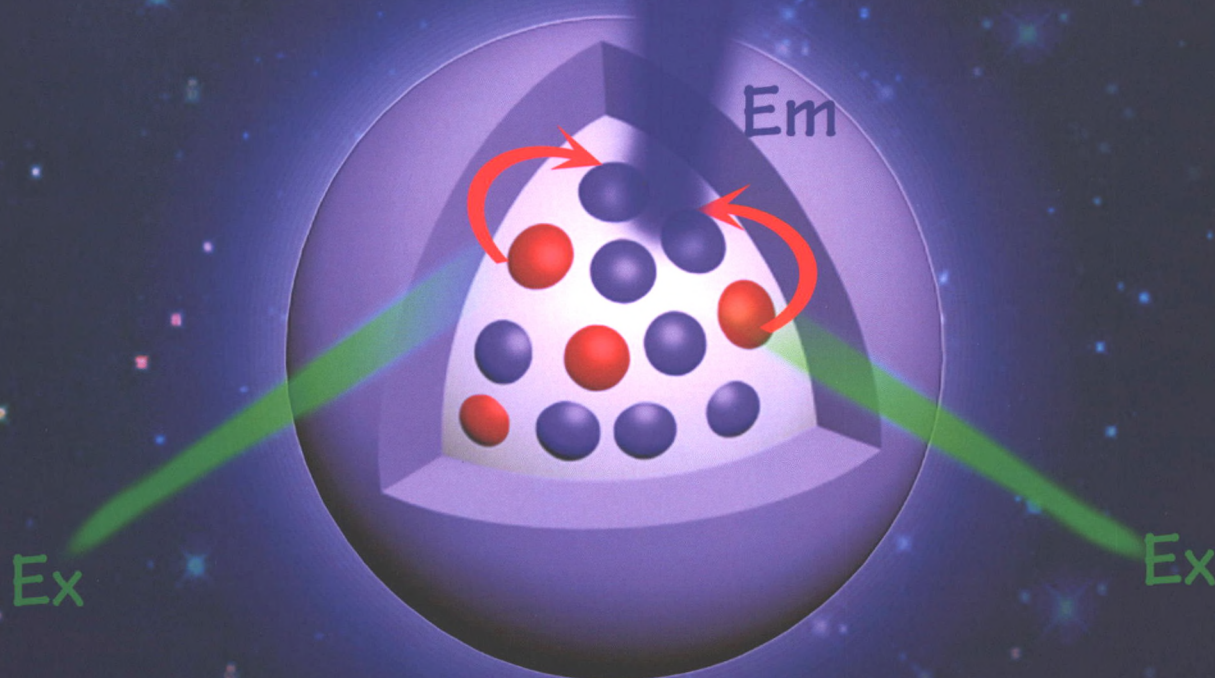
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化学学报

ACTA CHIMICA SINICA

2019 第77卷 第1期 Vol. 77 No. 1



Triplet-Triplet Annihilation Upconversion Emission

ISSN 0567-7351



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万方数据



中国化学会
中国科学院上海有机化学研究所

主办

化学学报

Acta Chimica Sinica

(Huaxue Xuebao)

第 77 卷 第 1 期 2019 年 1 月 15 日

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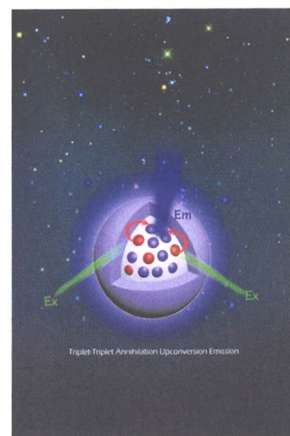
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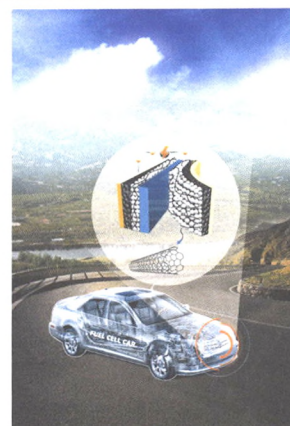
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* 通信联系人.

On the cover: The uniformed silica nanoparticles bearing sensitizer (fluorinated tetraphenylporphyrin platinum) and covalently-connected emitter (siloxane derivatized 9,10-diphenylanthracene) were constructed by micellar template method. The preparation of the water-stable nanoparticles is straightforward. Efficient upconversion emission based on triplet-triplet annihilation was achieved in water. [Wu, Lizhu *et al.* on page 41-46.]

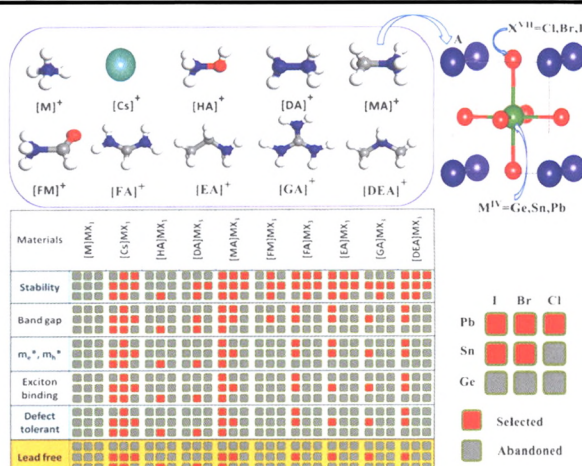


On the inside back cover: Adding carbon nanotubes to low Pt loading catalyst layers improves the utilization of Pt catalysts and mass transfer of reactant and product, as well as decreasing of the contact resistance between catalytic layers and gas diffusion layers, which obviously enhances the performance of proton exchange membrane fuel cell. [Lu, Shanfu *et al.* on page 47-53.]



Review

Research Progress of Compositional Controlling Strategy to Perovskite for High Performance Solar Cells



Chen, Xinyu; Xie, Junjie; Wang, Wei; Yuan, Huihui; Xu, Di; Zhang, Tao; He, Yunlong; Shen, Hujiang*

Acta Chim. Sinica **2019**, 77(1), 9-23

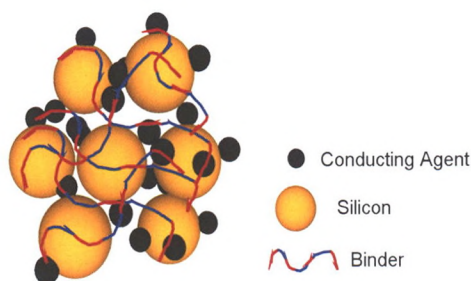
This review summarizes the recent progress on the perovskite materials with different component systems, including some representative material compositions and their effects on the device performance. Moreover, the advantages and disadvantages of perovskite materials with different component systems are compared and summarized. The purpose is to provide ideas on how to improve the efficiency and stability of perovskite solar cells through compositional controlling, and finally realize commercial application.

Recent Development on Binders for Silicon-Based Anodes in Lithium-Ion Batteries

Wang, Xiaoyu; Zhang, Yu; Ma, Lei; Wei, Liangming*

Acta Chim. Sinica **2019**, 77(1), 24-40

Article

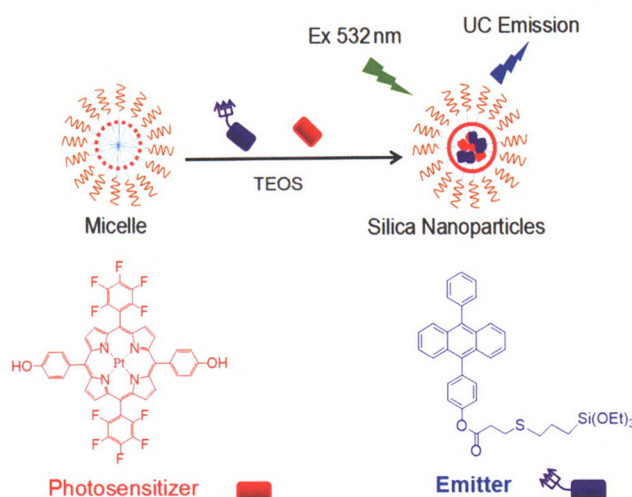


Binders, can improve the contact integrity among the active material, conductive additive and current collector of Li batteries. With different binders, the cracking and comminution caused by the huge volume change can be reduced, finally improving the cycle performance of the battery. Here, we gave a review on the lithium-ion battery silicon-based negative electrode binders systematically, which describes the main performance of different binders for battery properties. We hope our review will provide research directions for the development and application of lithium-ion battery silicon-based anode binders.

Triplet-Triplet Annihilation Upconversion Based on Silica Nanoparticles

He, Tong; Yang, Xiaofeng*; Chen, Yuzhe*; Tong, Zhenhe; Wu, Lizhu*

Acta Chim. Sinica **2019**, 77(1), 41-46

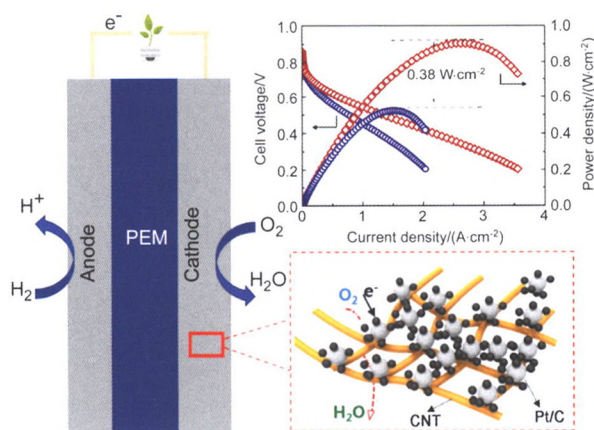


The stable uniformed silica nanoparticles bearing sensitizer and covalently-connected emitter were constructed by micellar template method. Efficient upconversion emission based on triplet-triplet annihilation was achieved in water.

Effect of Addition of Carbon Nanotubes on the Performance of a Low Pt Loading Membrane-Electrode-Assembly in Proton Exchange Membrane Fuel Cells

Cui, Lirui; Zhang, Jin; Sun, Yiyang; Lu, Shanfu*; Xiang, Yan*

Acta Chim. Sinica **2019**, 77(1), 47-53

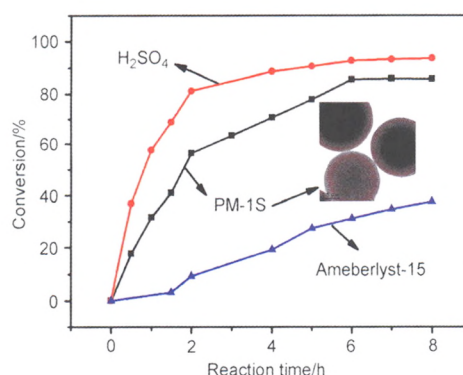


Carbon nanotube (CNT) is added to the low-Pt loading catalytic layers ($0.1 \text{ mg}_{\text{Pt}} \cdot \text{cm}^{-2}$) as an additive to study the effect of addition methods on microstructure of the catalytic layer and cell performance. The study shows that mixing of CNT and Pt/C catalyst into a catalytic layer is an effective method for improving the Pt utilization and reducing the loading of Pt catalyst.

Study on High Activity Monodispersed Sulfonated Porous Polystyrene Microspheres for Preparation of Biodiesel

Luo, Jianxin; Yan, Wenhai; Ma, Qing; Zhang, Chunyan*; Fang, Yiquan; Zhang, Xucheng; Wang, Changchun*

Acta Chim. Sinica **2019**, 77(1), 54-59

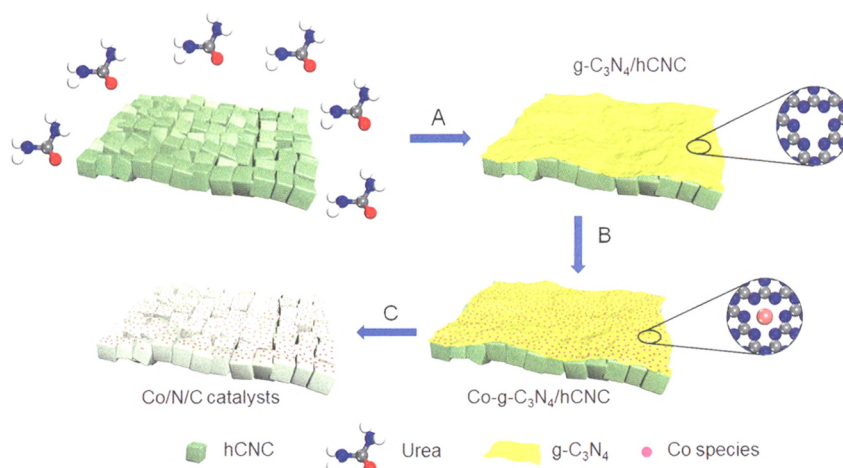


Sulfonated polystyrene microspheres (PM-1S) with high acid density were prepared by a facile two-step synthesis technique. The obtained sulfonated porous polystyrene microspheres exhibit high catalytic activity and good durability for preparation of biodiesel.

Construction of Cobalt/Nitrogen/Carbon Electrocatalysts with Highly Exposed Active Sites for Oxygen Reduction Reaction

Zhang, Zhiqi; Ge, Chengxuan; Chen, Yugang; Wu, Qiang*; Yang, Lijun; Wang, Xizhang; Hu, Zheng

Acta Chim. Sinica **2019**, 77(1), 60-65

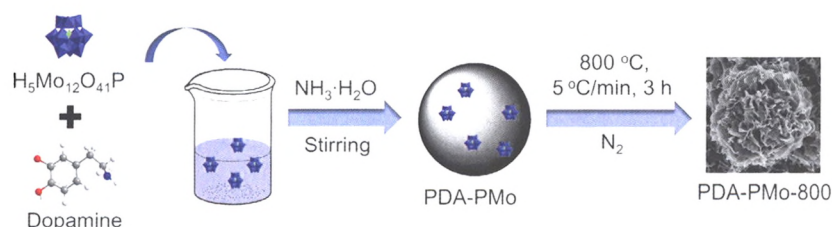


Cobalt/nitrogen/carbon electrocatalysts with highly exposed active sites are facilely constructed by pyrolyzing Co^{2+} coordinated $\text{g-C}_3\text{N}_4$ on high-conductive hierarchical carbon nanocages (hCNC). The optimized catalyst exhibits high ORR activity comparable to Pt/C catalyst, with much better stability and high immunity to methanol crossover in alkaline medium.

Molybdenum Nanocarbides Encapsulated in Porous Carbon Spheres for Solvent-free Benzyl Amine Oxidative Coupling Reactions

Li, Yue; Jiang, Yuchen; Jiang, Pingping; Du, Shengyu; Jiang, Jiusheng; Leng, Yan*

Acta Chim. Sinica **2019**, 77(1), 66-71

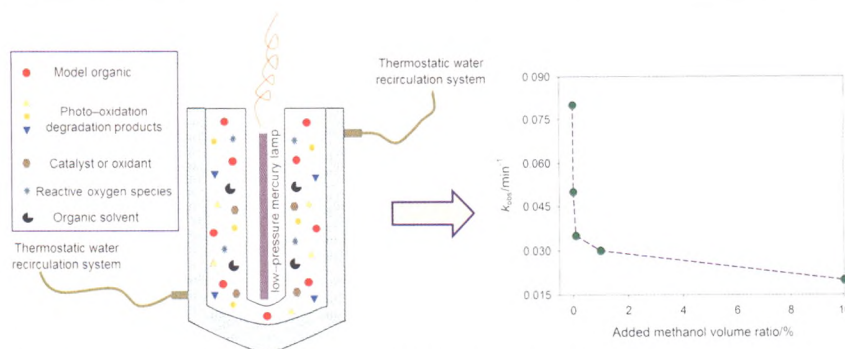


A new type of porous carbon-encapsulated Mo_2C was successfully prepared by pyrolysis PMo-contained dopamine polymer. The obtained catalyst exhibited high activity and selectivity in oxidative coupling of benzyl amines to form imines, and it can be repeatedly used and maintained good activity.

Influence Rule of Organic Solvents Methanol from Sample Preparation on Degradation Rate and Mechanism of Atrazine in UV-based Oxidation Processes

Liu, Yucan*; Su, Miaomiao; Zhang, Yan; Duan, Jinming; Li, Wei

Acta Chim. Sinica **2019**, 77(1), 72-83

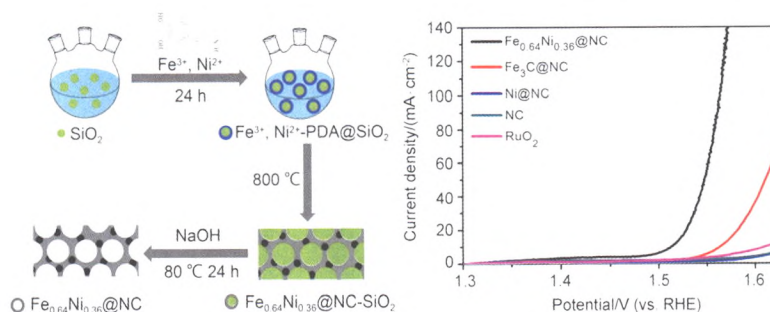


The effect of organic solvents on the reaction rate and degradation mechanism of atrazine has been investigated in three photo-oxidation process. The results show that methanol do not affect reaction rate of atrazine in sole-UV process, and a small effect for reaction rate of atrazine in UV/H₂O₂ process. However, methanol has significantly effect on the reaction rate of atrazine in UV/TiO₂ process. In addition, the presence and content of methanol did not change the degradation mechanism of atrazine.

Iron/nickel Alloy Nanoparticles Embedded in N-doped Porous Carbon for Robust Oxygen Evolution Reaction

Wang, Yilin; Wang, Minjie; Li, Jing*; Wei, Zidong*

Acta Chim. Sinica **2019**, 77(1), 84-89

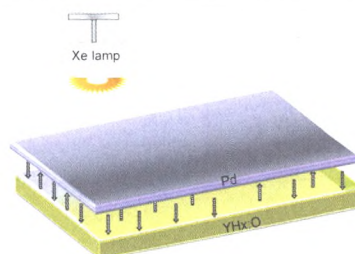


For an oxygen evolution reaction conducted in an alkaline solution, the non-noble-metal catalyst made by embedding Fe_{0.64}Ni_{0.36} alloy and metallic Fe nanoparticles in hierarchically porous nitrogen doped carbon framework, shows an overpotential as low as 286 mV to deliver a current density of 10 mA·cm⁻², being significantly lower than the value of 380 mV for RuO₂.

Effect of the Pd Layer on Optical Regulation Properties of the Oxygen Containing Yttrium Hydrides

La, Mao; Bao, Shan-Hu; Sha, Ren*

Acta Chim. Sinica **2019**, 77(1), 90-94



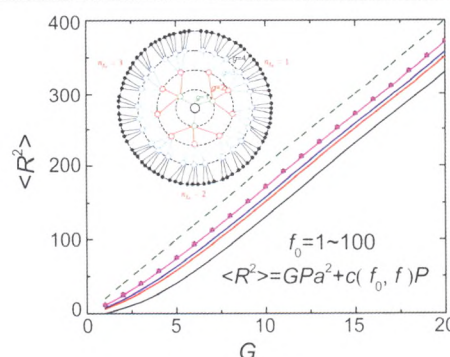
The oxygen-containing yttrium hydride (YH_xO) thin films coated with Pd were prepared by the magnetron sputtering method. In the initial state, the films showed a yellowish transparent state with high transmittance in the visible and near IR range. After illumination, the solar transmittance (T_{sol}) of the films sharply decreased 37.39% with dark state. This great optical change of the YH_xO/Pd resulted from the synergistic reaction of the two layers.

As we know, the metal Pd is an excellent catalyst for hydrogenation and dehydrogenation and the photochromic materials of the oxygen-contain yttrium hydride require introducing or releasing the hydrogen to achieve reversible transmittance change. This accelerates the photochromic process by transfer of the hydrogen from the YH_xO film layer to the Pd.

Self-Consistent Field Theory of Dendritic Homopolymers in θ Solvent

Fu, Chao; Yang, Yingzi*; Qiu, Feng

Acta Chim. Sinica **2019**, 77(1), 95-102



The segment density profile and scaling law of dendrimer in solvent are investigated by self-consistent field theory. The scaling law curves are obtained with different functionality of the center segment f_0 . The results of the self-consistent field calculation (colored symbols) show the power law relation $\langle R^2 \rangle \approx GPa^2$, which agrees well with the Rouse Model's prediction (solid lines) with large f_0 and G .



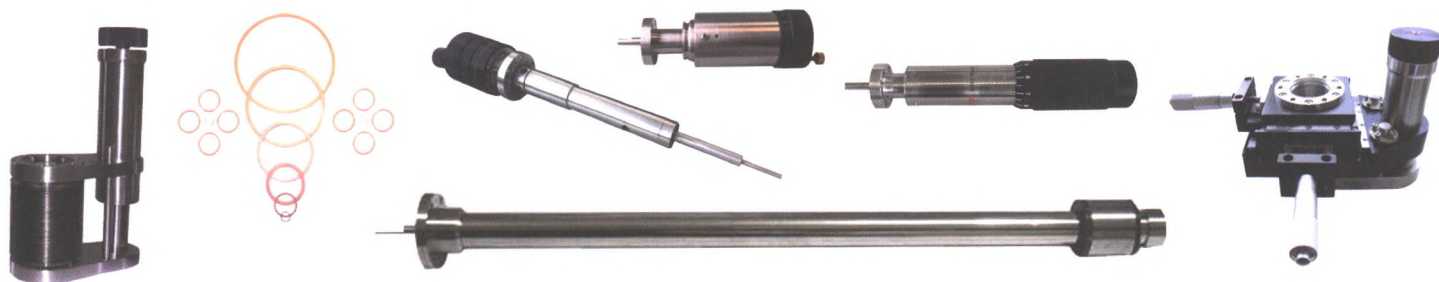
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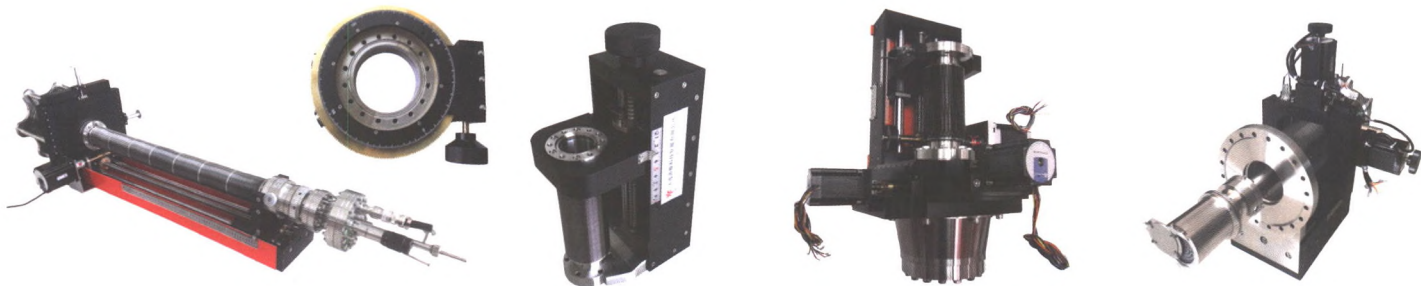
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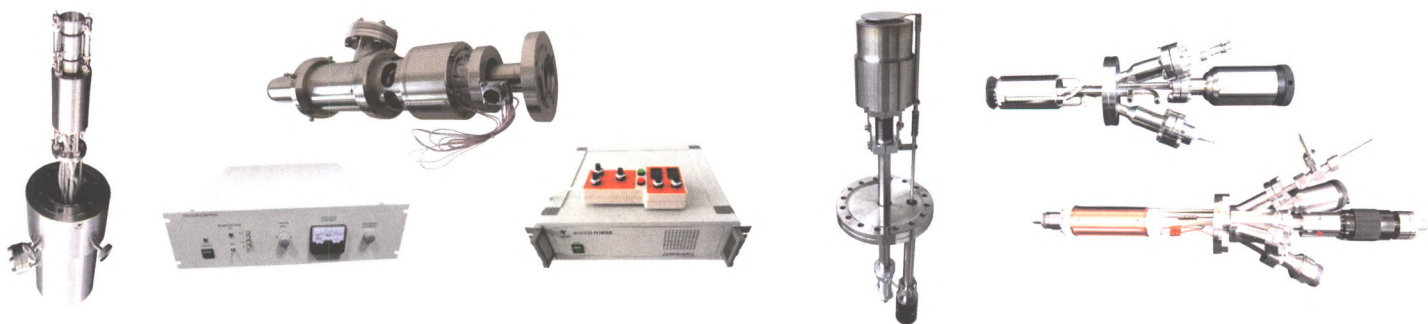
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