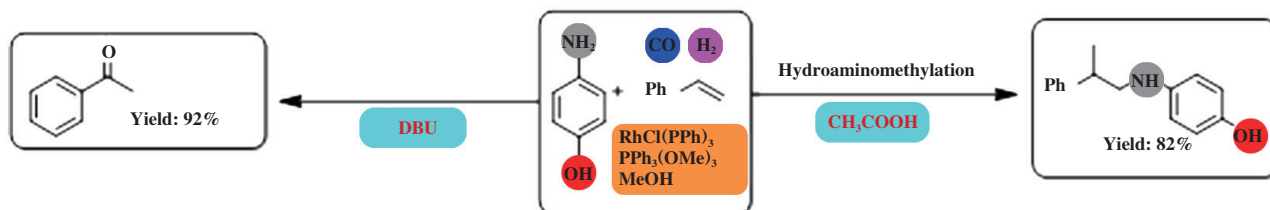


### The Hydroaminomethylation of Styrene with 4-Aminophenol

ZHENG Zhi-wen, WANG Lai-lai

J. Mol. Catal. (China) **2022**, 36(6): 513~521

An efficient catalytic system to achieve the high reactivity and selectivity of styrene with 4-aminophenol during the carbonylation reaction has been developed. The yield of hydroaminomethylation product has reached to a maximum of 82%. When DBU was used as an additive, the product acetophenone was obtained in the yield of 92%.



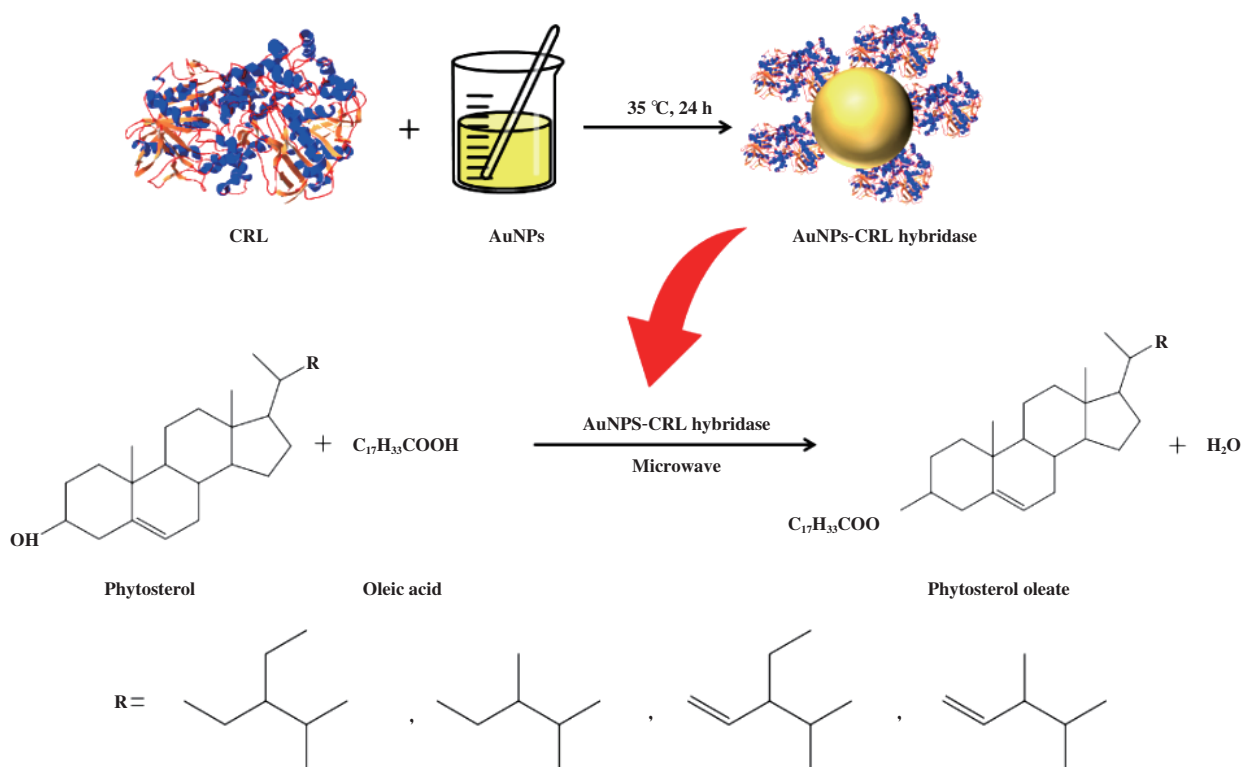
### Optimization of Microwave Enhanced Gold Nanoparticles-CRL Hybridase(AuNPs-CRL) Catalyzed Synthesis of Phytosterol Esters

YIN Yi, SUN Li-rui, FANG Qi-li, XIA Chun-gu, XIN Jia-ying

J. Mol. Catal. (China) **2022**, 36(6): 522~533

In order to further improve the lipid solubility of phytosterols

and lower melting points, an efficient and green method for the synthesis of phytosterol oleate under microwave irradiation with AuNPs-CRL hybridase as the catalyst was proposed. The optimal conditions for the microwave-enhanced AuNPs-CRL hybridase catalyzed synthesis of oleic acid phytosterols were as below: the particle size of AuNPs was 15 nm, the addition amount of AuNPs-CRL hybridase was 8%, the microwave power was 320 W, and the conversion rate of phytosterols was  $91.24 \pm 0.42\%$  after the reaction time of 64 min.



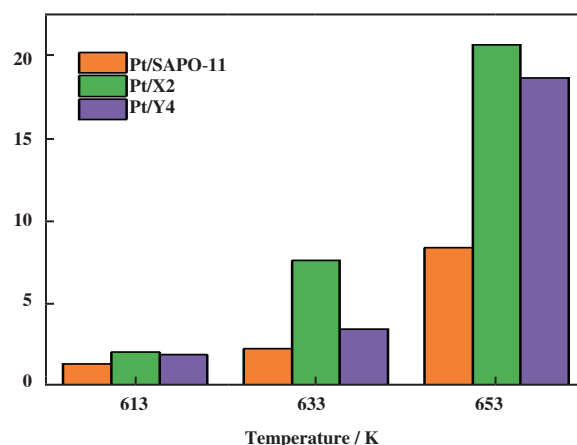
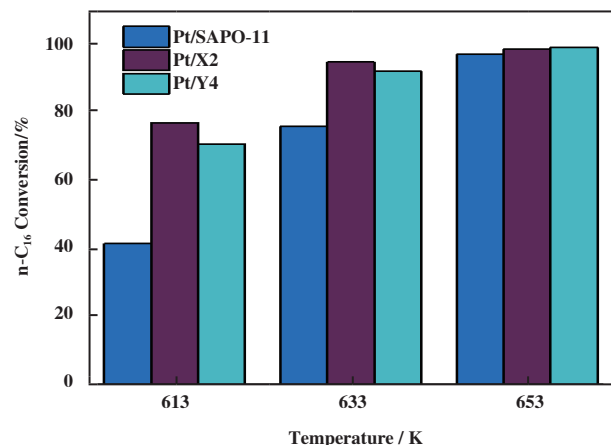
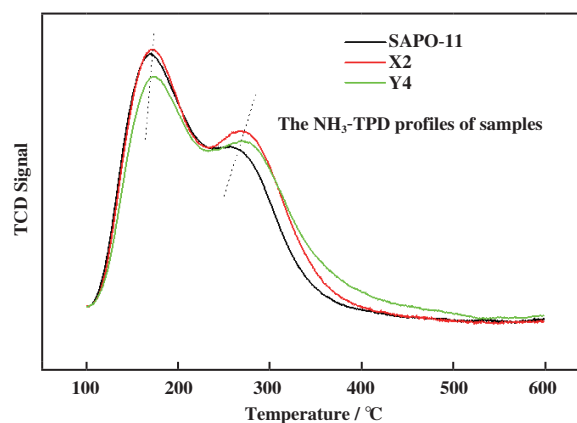
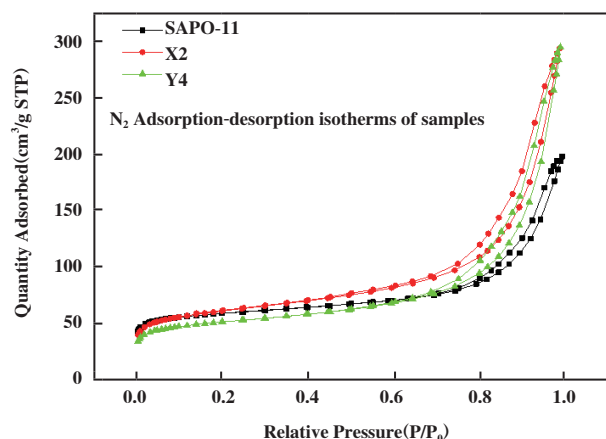
### Preparation of Highly Selective Hydrocracking/hydroisomerization Catalyst for *n*-Hexadecane by Tuning Porosity and Acidity of SAPO-11

REN Shen-yong, HUANG Zhi-gang, SUN Hua-yang,  
LI Xiao-qian, GUO Qiao-xia, SHEN Bao-jian

J. Mol. Catal. (China) **2022**, 36(6): 534~546

on the textural property and acid property of SAPO-11 was investigated respectively. The hydrocracking/hydroisomerization evaluation of catalysts Pt/SAPO-11 for *n*-hexadecane showed that the conversion of *n*-hexadecane and product selectivity on iso/*n* ratio could be improved after phosphoric acid modification and alkali modification.

A comparative study of acid and alkali modification



### Preparation of CuMnCeO<sub>x</sub> Catalysts by Complex Method with Citric Acid and Catalytic Oxidation at Ambient Temperature

HU Tao, HUANG Qiong, SUN Yue-yin, GU Ming-yang,  
XU Li-rui, AN Guo-fang, LI Xin, LI Da-wei, YANG Bo,  
TAO Tao

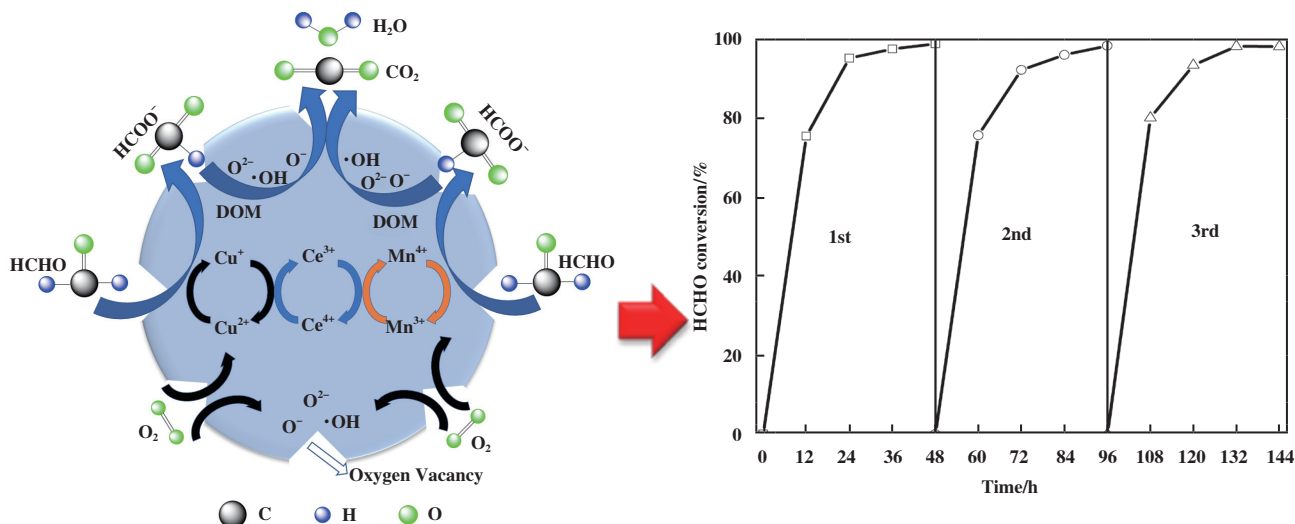
J. Mol. Catal. (China) **2022**, 36(6): 547~560

In order to remove a low concentration of formaldehyde, a series of CuMnCeO<sub>x</sub> catalysts were prepared and compared by complex method with citric acid and hydrothermal method for

catalytic oxidation of formaldehyde at ambient temperature. The results showed that CuMnCeO<sub>x</sub>-C catalysts exhibited higher activity and stability than CuMnCeO<sub>x</sub>-H owing to mesoporous structure, lesser size of crystal particle and the formed ceria-based Cu-Mn solid solution, which were conducive to a large number of oxygen vacancies synthesized. The HCHO removal rate reached 98.6%, fully meeting the requirements of GB50325-2001 (0.08 mg · m<sup>-3</sup>). The complex method with citric acid of CuMnCeO<sub>x</sub>-C also demonstrated a better resistance to water vapor attributed to the structure and synergism of these oxides. The high performance of CuMnCeO<sub>x</sub>-C assigned to the oxygen vacancies formed, which improved the amount of active oxygen

on the surface areas, and the possible oxidation mechanism with reaction process and intermediate products was also exhibited in this manuscript. As for power, the supported catalyst have a significant impact on the surface structure, morphology,

oxidation and water vapor resistance of catalysts, which provides a promising application in a HCHO oxidation at ambient temperature in indoor, instead of noble metal catalysts with a high activity, stability and a low cost.



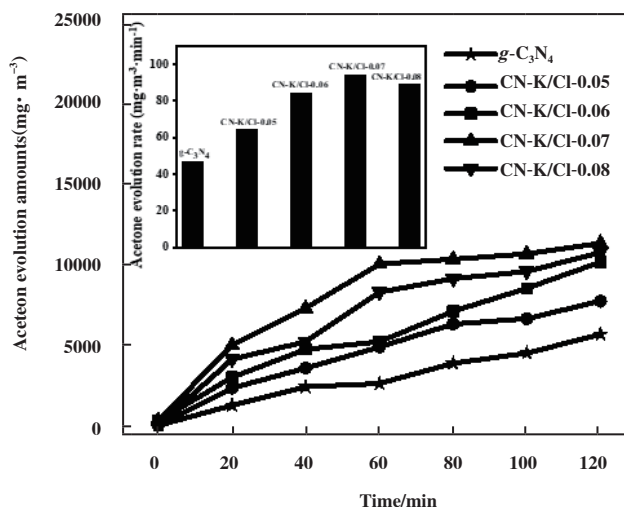
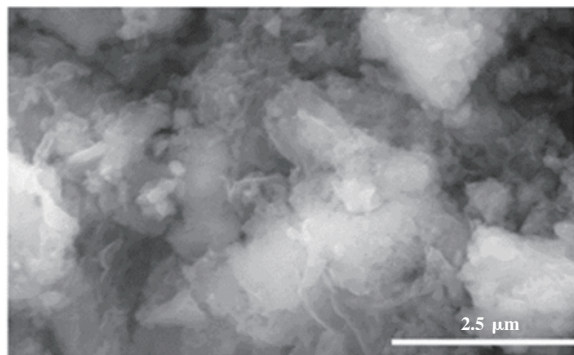
### Preparation and Photocatalytic Properties of K/Cl Doped $g\text{-C}_3\text{N}_4$

WANG Yan-xin, LIU Ya-jing, TAO Ran, FAN Xiao-xing

J. Mol. Catal. (China) **2022**, 36(6): 561~570

In recent years, photocatalytic semiconductor materials have been widely used in fields of organic gas pollutants degradation and purification. Graphitic carbon nitride ( $g\text{-C}_3\text{N}_4$ ), as a new type of non-metallic organic polymer semiconductor, has shown apparent advantage in photocatalytic field. In this study, K/Cl elements were selected as dopant to improve the photocatalytic performance of  $g\text{-C}_3\text{N}_4$ , K/Cl doped  $g\text{-C}_3\text{N}_4$  were prepared through

the method of combining sol gel and calcination technology using melamine and KCl as precursors. The introduction of K/Cl both enhance the specific surface area and visible-light absorption ability of  $g\text{-C}_3\text{N}_4$ . Furthermore, the synergistic effect of K/Cl inhibit the recombination of photogenerated electron-hole pairs by improving the transmission of photogenerated carriers. When evaluated by degradation of gaseous isopropanol, the photocatalytic activity of K/Cl doped  $g\text{-C}_3\text{N}_4$  exhibits high performance and good physics and chemistry stability. This work offered scientific basis and research evidence for constructing photocatalytic semiconductor materials for environmental remediation.



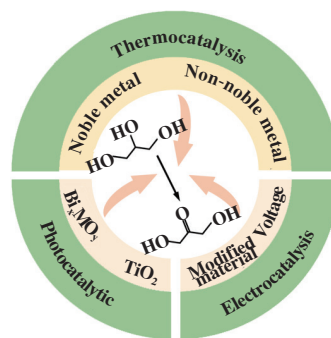
### Research Progress of Selective Oxidation of Glycerol to 1,3-Dihydroxyacetone by Heterogeneous Catalysis

HE Shan, WANG Wei-lu, PENG Xiang, ZHANG Yuan-bo, OUYANG Ping

J. Mol. Catal. (China) **2022**, 36(6): 571~583

This manuscript reviews the recent developments in selective oxidation of glycerol to 1,3-dihydroxyacetone (DHA) in heterogeneous catalysis systems. Novel catalysts involving noble metal and non-noble metal as active site were introduced in the unit of thermo-catalysis. The using of cost-efficient elements, such as Fe/SiO<sub>2</sub>, Cr-LDH, for facilitating glycerol oxidation is more economical. Generally, the central hydroxyl group of glycerol is preferentially oxidized, producing DHA in this traditional pathway. Besides, the oxidation transformation of glycerol in photo-catalysis and electro-catalysis systems attracts lot of concerns, due to their clean and low-cost advantages. For

photocatalysis, Bi-based materials as well as TiO<sub>2</sub> are classic catalysts for glycerol oxidation. They can absorb solar lights, then their charge carriers would help to the energy transfer and promote the reaction process. In the case of glycerol electro-oxidation, this system allows tuning the oxidizing conditions via changing the electrode potential, thus controlling the reaction rate and selectivity. The research perspective for this process also was in the end, which including the problems needed to be solved in the thermo-, photo-, and electro-catalytic systems.



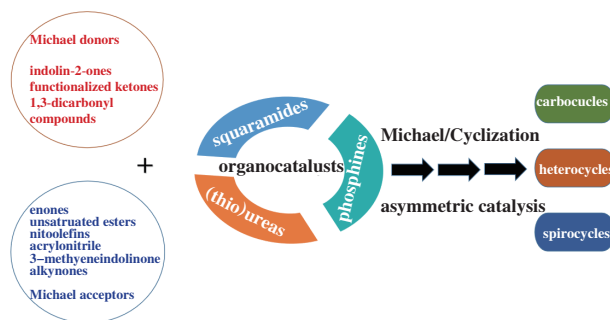
### Research Progress of Organocatalytic Asymmetric Michael/Cyclization Tandem Reaction

MU Hong-wen, JIN Yan, WANG Li-ming, ZHENG Ming-shan, JIN Ying

J. Mol. Catal. (China) **2022**, 36(6): 584~602

In Recent years, the asymmetric catalysis has focused on the development of cascade and multicomponent reactions, which expand the scope of organic synthesis. In particular, inexpensive and available organocatalysts have been widely used to promote consecutive chemical transformations in a one-pot manner. The asymmetric Michael/cyclization Tandem reactions are common methods to construct optically active cycle derivatives. They are

compatible with many different functional groups and provide high and predictable enantioselectivities for a wide range of substrates. Herein, we viewed the research progress on the organocatalyzed asymmetric Michael/cyclization Tandem reaction in the nearly five years according to different catalyst types, including phosphines, squaramides and (thio)ureas.



### Research Progress on Preparation of Aliphatic Nitriles by Ammonia Oxidation of Aliphatic Alcohols

LI Gui-xian, XIE Xiao-hu, TIAN Jun-ying, CHENG Xiao-wei

J. Mol. Catal. (China) **2022**, 36(6): 603~612

The research process of preparation of aliphatic nitriles by ammoxidation of aliphatic alcohols, which can be divided into aerobic oxidation-amination and dehydrogenation oxidation-amination, is reviewed. Moreover, the advantages and

shortcomings of the researches is analyzed and the development direction of the researches on ammoxidation reaction of aliphatic alcohols are prospected.

