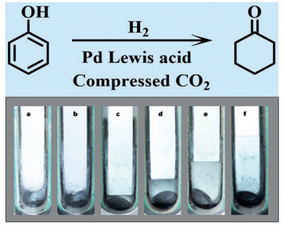
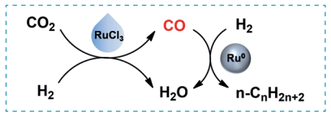
Research Group of Green Chemistry and Technology
Institute of Chemistry, Chinese Academy of Sciences



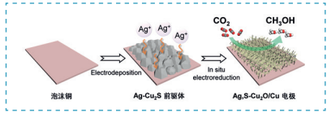
压缩 CO_2 中，苯酚选择性加氢制备环己酮产率达到 100%

100% yield was achieved in the selective hydrogenation of phenol to cyclohexanone in compressed CO_2



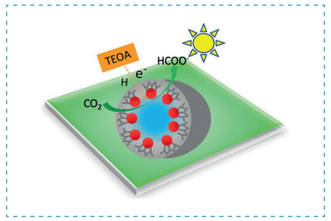
均相与多相催化耦合，实现 CO_2 加氢高效合成液体燃料

Highly efficient synthesis of liquid fuel by CO_2 hydrogenation via coupling of homogeneous and heterogeneous catalysis



原位双掺杂构筑高效电催化剂还原 CO_2 制备甲醇

In situ dual doping for constructing efficient CO_2-to-methanol electrocatalysts



水 / 超临界 CO_2 微乳液体系中光催化 CO_2 转化制甲酸

Photocatalytic conversion of CO_2 to formic acid in water/supercritical CO_2 microemulsion

Major contributors

Liu Huizhen
Qian Qingli
Zhu Qinggong
Sun Xiaofu
Kang Xinchen
Meng Qinglei
Zhao Yanfei

Focusing on the issues of resource waste and environmental pollution in conventional chemical processes, the group has been working on green chemistry and technology. They systematically studied physicochemical properties of a series of complex green solvent systems, and disclosed the relationships between the phase behaviors, intermolecular interactions, microstructures of the systems and their functions, which lay solid scientific foundation for the effective applications of green solvents in different fields, such as chemical reaction, material synthesis, separation and purification. The group opened up the research areas of absorbing SO_2 using ionic liquids and ionic liquid-based microemulsions, and developed a number of new strategies and routes for efficient transformation and utilization of renewable and recyclable carbon resources (e.g., CO_2, biomass, waste plastics). Their achievements have promoted the development of physical chemistry, green chemistry and technology, and are of great importance for green and sustainable development.

Outstanding contributors of this research group

Han Buxing

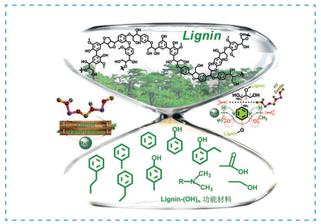
He designed and built a series of new apparatuses, achieved systemic results on the physicochemical properties of complex green solvent systems, and developed a number of new strategies and approaches for the transformation and utilization of biomass and CO_2.

Liu Zhimin

She proposed a variety of green solvent-mediated new strategies and routes for clean and efficient transformation of renewable/recyclable carbon resources, and developed a series of green synthetic approaches to chemicals.

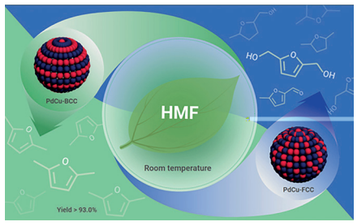
Zhang Jianling

She constructed different types of functional green solvent systems, proposed many green solvent-mediated new strategies for the synthesis of catalytic materials, and developed a series of new routes to efficiently convert CO_2.



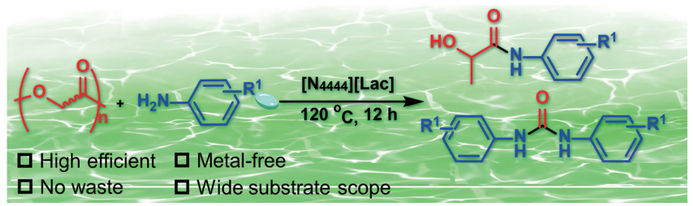
木质素转化制备重要化学品 / 燃料和功能性材料

Valorization of lignin into chemicals, fuels and materials



调控双金属晶体结构，实现了温和条件下生物质衍生物中 C-C/O 键的定向催化转化

Regulating the bimetallic crystal structure realizes the directional catalytic transformation of C-C/O bonds in biomass derivatives under mild condition



废弃塑料制重要化学品

Conversion of waste plastics into chemicals

研究团队合影

Research group photo

绿色化学与技术研究集体

推荐单位：中国科学院化学研究所

研究集体主要科技贡献：

该研究集体聚焦传统化学工业中的资源浪费和环境污染问题，开展绿色化学与技术研究，取得了一系列原创性成果。系统研究了多种绿色溶剂复杂体系的物理化学性质，揭示了体系相行为、分子间相互作用、微观结构与其性能的内在联系，为绿色溶剂在化学反应、材料制备、分离等领域的应用奠定了重要科学基础。开辟了离子液体吸收 SO_2 新方向和离子液体微乳液研究新方向。发展了多种可再生、可循环碳资源（如 CO_2、生物质、废弃塑料）清洁高效转化利用的新方法和新路线。研究成果推动了物理化学、绿色化学与技术的发展，对实现绿色与可持续发展具有重要意义。

研究集体突出贡献者

韩布兴 Han Buxing

韩布兴 中国科学院化学研究所

主要科技贡献：研制多套新型仪器装置，在绿色溶剂复杂体系物理化学性质研究方面取得系统性原创成果，发展了生物质、CO_2等碳资源转化利用的多种新方法和新路线。

刘志敏 Liu Zhimin

刘志敏 中国科学院化学研究所

主要科技贡献：提出多种绿色溶剂调控催化可再生/可循环碳资源清洁高效转化的新策略和新路线，发展了一系列绿色合成新方法。

张建玲 Zhang Jianling

张建玲 中国科学院化学研究所

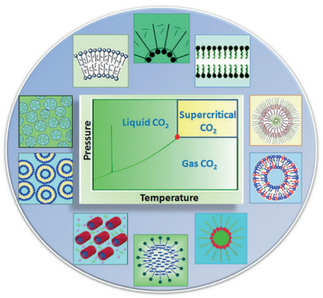
主要科技贡献：构建了不同种类功能绿色溶剂体系，提出多种调控合成催化材料的新方法，发展了系列高效催化CO_2转化的新途径。

研究集体主要完成者

刘会贞　钱庆利　朱庆宫　孙晓甫　康欣晨　孟庆磊　赵燕飞

与企业合作，开发废弃碳资源循环转化利用技术

Cooperation with company to develop the technology for recycling and conversion of waste carbon resource



创制构建一系列功能绿色溶剂体系

A series of functional green solvent systems were created and constructed