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Minimizing the use of non-green polar aprotic solvents by rational design of catalytic systems

Abstract

Dipolar aprotic solvents (DMSO, DMF, DMAc, NMP, etc.) have been widely used in organic synthesis and pharmaceutical research because of their remarkable polarities and solubilities. However, most of them are not green, and their uses often resulted in serious detrimental effects on human health and also on the natural environment. This abstract summarizes the methods and strategies for replacing non-green polar aprotic solvents, which mainly include direct replacement with new green alternatives and utilization of polarized catalysts in common green solvents for avoiding the use of conventional polar aprotic solvents. Some catalytic systems were also developed for minimizing the use of the non-green polar and aprotic solvents. Compared with the direct replacement strategy, the rational design of polarized catalysts not only expands the choice of green solvents, but also provides new possibilities for the design and preparation of multifunctional catalysts, suggesting a promising prospect in substitution strategies for non-green polar aprotic solvents.

venerdì 13 giugno 2025 - Ore 15.00

Aula B

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Yanlong Gu received his BSc degree in 1999 from Inner Mongolia University, Hohhot, China. In 2005, Yanlong Gu obtained his PhD degree from Lanzhou Institute of Chemical Physics, Chinese Academy of Science. He started then a journey as post-doc researcher in the University of Tokyo, Japan and the University of Poitiers, France. Since October 2008, Yanlong Gu become a professor in School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology, Wuhan, China. Yanlong Gu has a broad interest in homogeneous and heterogeneous catalysis, organic synthesis, biomass valorization, and green solvents like ionic liquids and bio-based media. In the past two decade, Gu has published more than 100 research papers, and contributed 6 book chapters in the fields. Yanlong Gu is a board member of Chinese Journal of Catalysis, and Industrial Chemistry & Materials.