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Recent advances in heteropoly acids-catalyzed organic reactions in water

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One of the most striking concepts in chemistry for sustainability is green chemistry, and it is the applications of set of principles that reduces or eliminates the use or generation of hazardous substances in the design, synthesis, production and applications of chemical products. As far as the largest amount of "auxiliary waste" is associated with solvent usage, accordingly, a part of green chemistry connects to the elimination of volatile organic solvents or their replacement by nonvolatile, nonflammable, nontoxic, and inexpensive green solvents. In this regard, the use of water in organic reactions has developed not only the issues and aspects of the reactions from the viewpoint of green and sustainable properties but also the synthetic competence by reducing the number of steps, stabilizing the catalyst, facilitating product isolation, changing the reaction selectivity, even when the reactants are sparingly soluble or insoluble in this medium. Although "on water" techniques have provided excellent solutions for some situations, there will be cases, such as using heteropoly acids (HPAs), where complete solubility in water is much desired. HPAs are promising solid acids to replace environmentally unsafe and hazardous liquid acid catalysts. The catalytic application of HPAs, polyoxometalates (POMs) as efficient homogeneous or heterogeneous solid acids catalysts have been recognized and established both by successful large-scale applications in industry and promising laboratory results. Herein, the author wishes to present the advances in application of HPAs, their salts, and POMs in organic synthesis in aqueous systems.

Biography

Majid M Heravi was born in 1952 in Mashhad, Iran. He received his BSc degree from National University of Iran in 1975 and his MSc and PhD degrees from Salford University, England, in 1977 and 1980 respectively.. He started his academic career as an Assistant Professor in Ferdowsi University of Mashhad, Iran in 1983. He moved as Professor to Alzahra University, Tehran, Iran in 1999, where he is still working in. He has previously been a Visiting Professor at UC Riverside, USA, and Hamburg University, Germany. His research interests focus on heterocyclic chemistry, catalysis, organic methodology and green synthetic organic chemistry. He has published more than 600 papers in ISI cited journals.

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