



catalysts



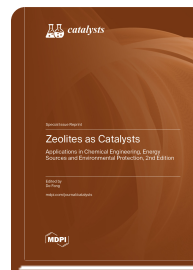
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Zeolites as Catalysts

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Edited by
De Fang

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Zeolites, with their unique microporous crystalline structures, high surface areas, and tunable acidity, have long been pillars of heterogeneous catalysis. Their well-defined pore systems grant them exceptional shape-selectivity, enabling precise control over reaction pathways that is unparalleled by other catalytic materials. Traditionally, zeolites have been indispensable in major industrial processes such as fluid catalytic cracking (FCC), hydrocracking, and petrochemical production, forming the backbone of the modern refining and chemical industries. Today, the role of zeolites is rapidly expanding beyond these traditional boundaries, driven by global demands for sustainability and green chemistry. In the realm of energy, they are crucial for the production of biofuels and in emerging hydrogen storage technologies. In environmental protection, zeolites serve as robust catalysts for the removal of NO_x from exhaust gases (SCR), the oxidation of volatile organic compounds (VOCs), and advanced water purification. Furthermore, their application in the synthesis of fine chemicals and renewable platform molecules highlights their versatility.



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