



nanomaterials



Special Issue Reprint

Application of New Nanoparticle Structures as Catalysts

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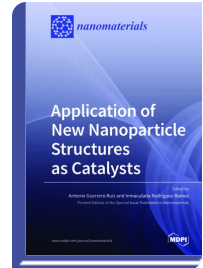
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Catalysts are made of nanoparticles of metals, metal oxides, and other compounds that may act as active phases, support the latter, or a combination of both. The initial incentive to reduce as much as possible, up to the nano-scale, the size of the particles of active catalyst components is to maximize the surface area exposed to reactants, thus minimizing the specific cost per function and increasing the rate of conversion of feedstocks to products in relatively simple reactions. Nowadays, the interest in nanocatalyst developments has shifted to an emphasis on improving the selectivity of catalysts, allowing one to obtain desirable reactions in more complex synthetic processes. Thus, new generations of nanocatalysts should be designed at the molecular level to display well-defined structural characteristics, in terms of size, shapes, hierarchical porosity, and morphologies, as well as with controlled chemical composition. The development of efficient nanocatalysts supposes the characterization of their various surface active sites at the nanometer scale, which is focused on establishing synthesis–structure–performance relationships.



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