Green Catalysts for Sustainable Energy and Environment

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ABSTRACT

Increasing concerns over global warming caused by greenhouse gases and depletion of fossil fuel resources have created a variety of strategic routes for sustainable energy and environment. Carbon dioxide (CO_2) and methane (CH_4) are considered to be major components of greenhouse gases, and therefore the conversion of CO_2 and CH_4 to value-added products is one of the most promising ways to mitigate the problem. This presentation is focused on the production of a group of green catalysts and adsorbents from low cost and renewable resources. The diverse applications of green catalysts for sustainable energy and environment—green energy/feedstock production via catalytic CO_2 hydrogenation under magnetic field, catalytic methane decomposition and light olefin production over functional catalysts, an application of chlorophyll-modified green catalysts for photodegradation of rhodamine B under visible-light irradiation—are reviewed. Structure-reactivity studies of green catalysts using Synchrotron light sources are discussed.

Keywords: Mesoporous silica-aluminosilicate; CO_2 hydrogenation; External magnetic field; Chlorophyll; Visible light; Green catalyst

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