

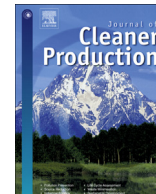


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Review

Recent advances in dry reforming of methane over Ni-based catalysts



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ABSTRACT

A steady increase in atmospheric carbon dioxide (CO₂) and methane concentrations in recent decades has sparked interest among researchers around the globe to find quick solutions to this problem. One viable option is a utilization of CO₂ with methane to produce syngas via catalytic reforming. In this paper, a comprehensive review has been conducted on the role and performance of Ni-based catalysts in the CO₂ reforming of methane (sometimes called dry reforming of methane, DRM). Coke-resistance is the key ingredient in good catalyst formulation; it is, therefore, paramount in a choice of catalyst supports, promoters, and reaction conditions. Catalyst supports that have a strong metal-support interaction created during the catalyst preparation exhibit highest stability, high thermal resistance and high coke resistance. In addition, the outlook of the Ni-based catalysts has been proposed to provide researchers with critical information related to the future direction of Ni-based catalysts in industrial settings. Among others, it has been a great interest among researchers to synthesize catalyst supports from cellulosic materials (plant-based materials). The unique properties of the cellulose which are a well-defined structure and superior mechanical strength could enhance the catalytic activity in the DRM reaction.