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Catalysis for CO₂ conversion; perovskite based catalysts

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ABSTRACT

CO₂ conversion processes require the use of active catalysts due to the endothermicity of these reaction processes. The use of heterogeneous catalysts such as perovskites is gaining more attention due to their ease of separation, stability in handling, catalyst reuse and reproductively. Perovskite possesses wide industrial, scientific and commercial importance because of their cost effectiveness and stability in high temperature conditions while offering flexibility of its structures. CO₂ is effective as a reagent for the conversion of hydrocarbons into more useful products like H₂, syngas and liquid fuels. Researchers have focused extensively on CO₂ reforming of methane (CRM) as the process mitigates two readily available greenhouse gases. However, the overall conversion in this process is dependent on factors such as amount/ratio of reactants, reaction conditions and type of catalysts used. Majorly, perovskites have been applied as catalysts for CO₂ reforming because they possess highly mobile oxygen molecules. This property is essential to suppress the formation of carbon during the reaction. Moreover, its stable nature in a reducing environment gives it an edge over other types of catalysts used for CO₂ reforming. Hence, the focus of this chapter is on the role played by perovskites as catalysts in the CO₂ reforming of methane reaction process.

KEYWORD

CO₂ conversion; Catalysis; Methane; Perovskite; Reforming