Advanced catalysts and effect of operating parameters in ethanol dry reforming for hydrogen generation. A review

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ABSTRACT

There is actually an intense research in ethanol dry reforming because bioethanol and carbon dioxide, a greenhouse gas, can be converted into syngas and, in turn, into chemicals and energy such as dihydrogen (H_2). Here we review dry reforming of ethanol with focus on thermodynamics, catalysts and effect of operating conditions. Noble metal-based catalysts typically exhibit both ethanol and CO_2 conversions above 85% in the range of 923–1073 K, yet the high cost of precious metals has restrained their potential applications. H_2 yield of 90% and above is achieved at 1073 K or above due to the endothermic nature of ethanol dry reforming. Improving catalytic performance and inhibiting coke formation may be achieved by using bimetallic catalysts and other types of metal oxides.

KEYWORDS
Ethanol dry reforming; Syngas; Thermodynamic; Catalyst; Operating conditions; Carbon formation; Hydrogen

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