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## Improvement of Lifetime of Ni/Mordenite Catalysts for CO<sub>2</sub> Reforming of Methane by Support Modification with Alumina and Co-K Loading

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To improve the lifetime of catalysts for CO<sub>2</sub> reforming of methane, Ni/H-mordenite catalyst was modified, which has high performance for the reaction. The unmodified catalyst was deactivated due to collapse of the zeolite structure at 1173 K, and the catalyst activity was reduced by carbon deposition at 923-973 K. Two methods of modification were evaluated to suppress deactivation of the catalyst. Firstly, surface modification of the mordenite support with alumina or titania resulted in no deactivation at 1173 K. XRD analysis of the fresh and the used catalysts showed higher stability of the modified catalysts. Secondly, Co-loading of nickel with cobalt and/or potassium resulted in suppression of the catalyst deactivation by carbon deposition at 973 K. Finally, a new catalyst with longer lifetime, Ni-Co-K/HM-Al<sub>2</sub>O<sub>3</sub>, was prepared with activity maintained for more than 300 h at 973 K.

**Keywords:** [Methane dry reforming](#), [Nickel cobalt potassium catalyst](#), [Mordenite](#), [Alumina](#)

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