

Nickel Supported on Mesoporous Alumina modified by Combustion method as Catalysts for Dry Reforming of Methane

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Dry reforming of methane (DRM) for the production of syngas has attracted much attention. Large amounts of the greenhouse gases are leading to the global warming, namely, greenhouse effect. Dry reforming of methane is a potential route to simultaneously transform these two greenhouse gases into more valuable synthesis gas. In this work, Ni catalysts supported on ordered mesoporous alumina (OMA) were prepared by EISA method and calcined under air and Ar atmospheres. The catalyst calcined under Ar atmosphere. Nickel species of Ar calcined catalyst were reduced to metallic nickel particles by auto-combustion method. Both catalysts showed stable performance in the dry reforming of methane for 24 h. However the catalytic activity for Ar calcined catalyst was relatively lower than that of air calcined one. It was found that the carbon (C_β) layer around nickel particles was observed for Ar calcined catalyst after the dry reforming of methane. The encapsulating carbon species in Ar calcined catalyst is lowering the mass transfer rate of feeds led to lower performance, but no whisker carbon (C_v) was observed.