CO₂ reforming using TiO₂/Ni catalysts prepared by atomic layer deposition

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Atomic layer deposition (ALD) was used to deposit TiO₂ on Ni particles, and changes in the catalytic activity of Ni for CO₂ reforming of methane (CRM) were studied. In the presence of TiO₂ islands on Ni surfaces, the onset temperature of the CRM reaction was lower than that of bare Ni. During the CRM reaction, carbon was deposited on the surface, reducing the catalytic activity of the surface, but TiO₂ was able to remove the carbon deposits from the surface. When the Ni surface was completely covered with TiO₂, catalytic activity disappeared, indicating that tuning of TiO₂ coverage on Ni is important for maximizing the activity of the CRM reaction.

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