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**Catalytic Performance of Nickel Nanowires Immobilized in Silica
Aerogels for the CO₂ Hydration Reaction**

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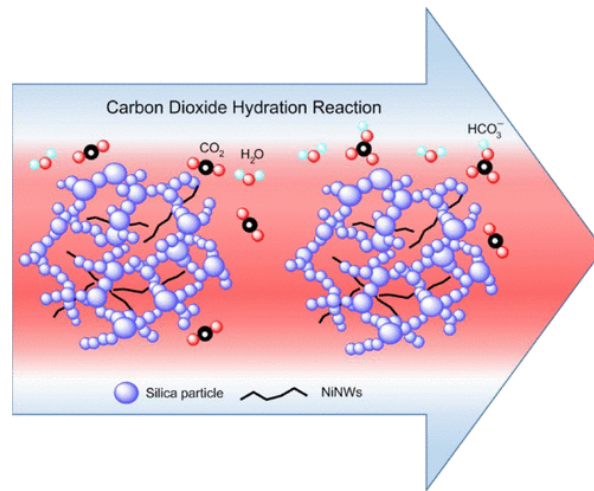
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Abstract

In this work, wavy nickel nanowires (NiNWs) were immobilized on mesoporous silica (SiO₂) aerogels by the sol–gel method. We measured the catalytic activity of pure NiNWs and NiNW–SiO₂ aerogel composites toward the CO₂ hydration reaction (CHR) when they are in water. Dynamic vapor sorption (DVS) analysis was performed at levels of 50% CO₂ and 50% H₂O vapor for SiO₂ aerogels, immobilized nickel nanoparticles (NiNPs) on silica aerogel and NiNW–SiO₂ aerogel composites, in order to determine catalytic activity for CHR in the gaseous phase. The results from DVS analysis (gaseous phase) and CHR (aqueous phase) showed that NiNW–SiO₂ aerogel composites are good heterogeneous catalysts for CHR in both gaseous and aqueous phases but they are less active than NiNP–SiO₂ aerogel composites.



Key words

Silica aerogel, NiNWs, CO₂ hydration