

### Autocatalytic activation of intermetallic compound Ni<sub>3</sub>Al thin foils in methanol decomposition

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Methanol decomposition was carried out over flat cold-rolled foils of intermetallic compound Ni<sub>3</sub>Al in a temperature range of 513–793 K. The methanol decomposition into H<sub>2</sub> and CO was effectively catalyzed at 713–793 K, due to the autocatalytic activation of the Ni<sub>3</sub>Al foils, viz., both catalytic activity and selectivity rapidly increased with increased time and then became stable. Surface analyses revealed that fine Ni particles supported on porous carbon nanofibers formed on the foil surface during the reaction at 713–793 K. We attribute the high catalytic performance of the foils at 713–793 K to the spontaneous formation of these surface products. The results demonstrate that the Ni<sub>3</sub>Al foils are highly promising as both catalysts and structural sheets of micro-channeled reactors for hydrogen production from methanol, without any need for coating of catalyst layers.