

## **Evaluation of NiO/TALC Catalytic performance in carbon dioxide reforming of methane**

### **ABSTRACT**

A series of NiO/Talc (Talc = talcum) catalysts with various Ni loadings (5–15 wt%) has been synthesised via the wet impregnation method and utilised for dry reforming of methane (DRM). All catalysts showed promising catalytic DRM performance and 10%NiO/Talc was found to be the most effective catalyst with 98% CH<sub>4</sub> and 80% CO<sub>2</sub> conversion respectively (SH<sub>2</sub> = 65%; H<sub>2</sub>/CO close to ~1.2) at 700 °C reaction temperature under 1 atm pressure reaction condition. This finding confirmed that excellent DRM activity was corroborated with the high surface area, good NiO dispersion, good basic properties, excellent reducibility and formation of the Mg<sub>2</sub>Ni phase. The DRM increased with reaction temperature, whereas 700 to 800 °C showed the most optimum activity. The 10%NiO/Talc catalyst appears to have longer a lifetime (highly stable) with low coke affinity. This is confirmed by the high and consistent (CH<sub>4</sub> & CO<sub>2</sub>) conversion with moderate carbon formation (20 wt%) over 10 h reaction time.