

# Nanostructured catalysts for tar reforming with high tolerance to poisoning

## Overview

Tar reforming catalysts used in the purification of raw syngas from the gasification of biomass/ municipal solid waste can be easily deactivated in the presence of impurities. Nanostructured nickel-based catalysts supported on alumina were developed to resist poisoning effects of sulfur and halogens ( $\text{H}_2\text{S}$ ,  $\text{HCl}$  and  $\text{HBr}$ ). The catalysts are synthesized in hydrothermal conditions to ensure strong nickel-support interactions that were found crucial for maintaining high tolerance towards poisoning.

## Key features

- Nanoflake- and nanospindle-shaped catalysts with high Ni dispersion and strong Ni-support interactions facilitating mass transport and reforming activity.
- High resistance to Ni particle sintering.
- High tolerance towards poisoning by  $\text{H}_2\text{S}$  (1-50 ppmv) and  $\text{HCl}$ ,  $\text{HBr}$  (1-2000 ppmv).
- Stable activity at high temperatures of 800-850 °C and gas hourly space velocities of 24,000-40,000  $\text{h}^{-1}$ .

## Applications

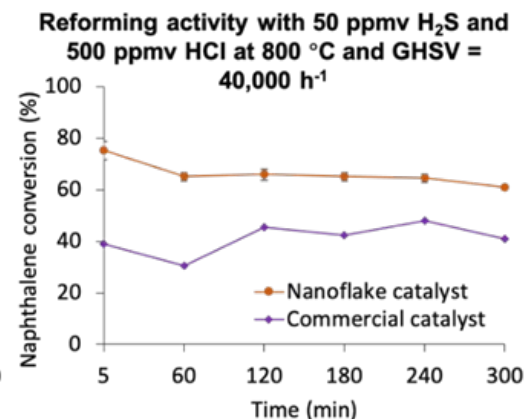
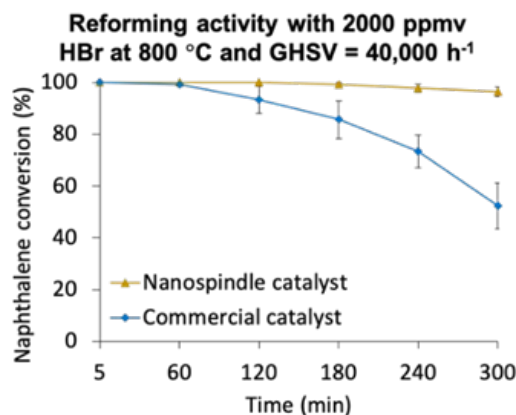
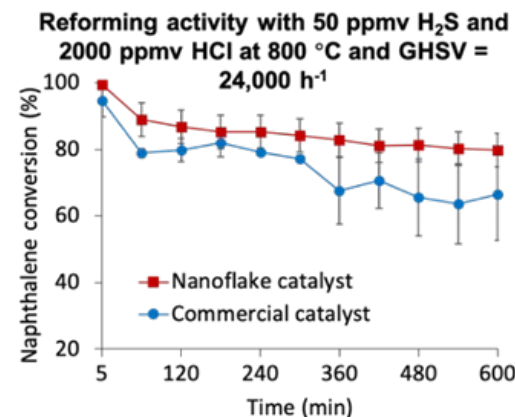
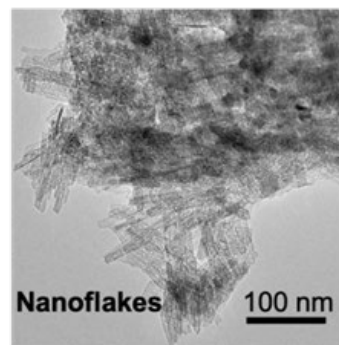
- Tar reforming of raw syngas containing halogen and sulfur compounds produced during the gasification of municipal solid waste or biomass.

## Market opportunities

- Biomass and municipal solid waste gasification plants.
- Purification of raw syngas for energy generation and chemical synthesis (e.g., methanol, Fischer-Tropsch synthesis, hydrogen, etc.).

## Advantages and benefits

- Strong metal-support interaction due to the high dispersion of Ni on catalyst surface.
- Higher reforming activity and high stability for at least 10 h compared to commercial catalysts.



Inquiries? Get in touch with  
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