



Exhaust gas treatment with  
non-precious metal catalysts

**Methane oxidation catalysts for gas engines**

According to the Intergovernmental Panel on Climate Change's Assessment Report, the 1.5 °C target of the Paris Climate Agreement cannot be achieved without an active reduction in methane emissions. In Glasgow, more than 100 countries therefore joined the Global Methane Pledge and committed to a 30 % reduction in methane emissions relative to the year 2020.

**Non-precious metal catalysts for methane oxidation**

Compliance with current and future methane emission limits in gas-powered engines requires the use of suitable exhaust gas after-treatment technologies. One possibility for this is the complete catalytic oxidation of the methane slip.

In the "IMOKAT" project, Fraunhofer UMSICHT has developed and tested an

innovative methane oxidation catalyst in cooperation with partners from industry and science to reduce the exhaust emissions of ship engines in natural gas operation. With the developed formulations, full catalyst honeycombs could be successfully extruded for direct use in the engine. The catalysts initially show full conversion of methane to carbon dioxide and water. First findings on long-term stability are also available.

*Fraunhofer UMSICHT develops, among other things, non-precious metal catalyst systems for exhaust gas treatment.*

**Industrial sectors**

- Engine manufacturer
- Exhaust gas aftertreatment

## Catalyst specification

1. Catalyst based on non-precious metals (cerium and manganese)
2. Mechanically stable full catalyst honeycomb
3. Methane conversion > 60 % at a maximum temperature of 550 °C
4. Stable methane conversion for 100 h time on stream in the presence of 10 vol.% water in the reactant gas.

## Keywords

- Industrial catalysts
- Catalyst development
- Base metal catalysts
- Scale-up
- Shaping
- Exhaust gas treatment
- Methane oxidation

## Our service

- Development of non-precious metal catalyst systems for exhaust gas treatment
- Catalyst screening and characterization
- Scale-up of catalyst development (precipitation reactions up to 200 liters).
- Catalyst testing under realistic conditions
- Development of ceramic extrusion compounds
- Extrusion of a wide variety of shaped catalysts up to a diameter of 20 millimeters
- Functionalization of shaped catalysts (e. g. electrical conductivity)

## Your benefit

Together with you, we develop and optimize new cost-effective catalysts that are adapted to your specific application. You benefit here from our many years of expertise.

Our focus is always on meeting your needs. In order to process your task in a targeted manner, we provide you with competent advice and develop customized offers.

Contact us!

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