Fraunhofer
UMSICHT

Catalysts for industrial use

From catalyst development to scale-up

Whether as a component of fuel cells, as a key to the material use of CO_2 or as an instrument for gas purification – catalysts are indispensable for many processes in industry. The development of a new catalyst is a lengthy process and can take 15 to 20 years from the first laboratory tests to market launch.

8-fold parallel reactor system for rapid screening of small amounts of catalyst.

Catalysis research at Fraunhofer UMSICHT

With many years of expertise in the field of industrial catalysts and extensive technical equipment with which catalysts can be prepared, characterized and tested, Fraunhofer UMSICHT supports you in noticeably shortening development cycles for catalysts.

The core elements of our service offer are the scale-up, shaping and testing of industrial catalysts under practical conditions, so that new catalysts can be used more quickly in the technical process. In doing so, we are always looking for interesting catalyst developments worldwide. Our own development work focuses on new, precious metal-free catalytic materials.

Industrial sectors

- Chemical industry
- Steel industry
- Cement industry
- Fuel cell manufacturer
- Engine manufacturer

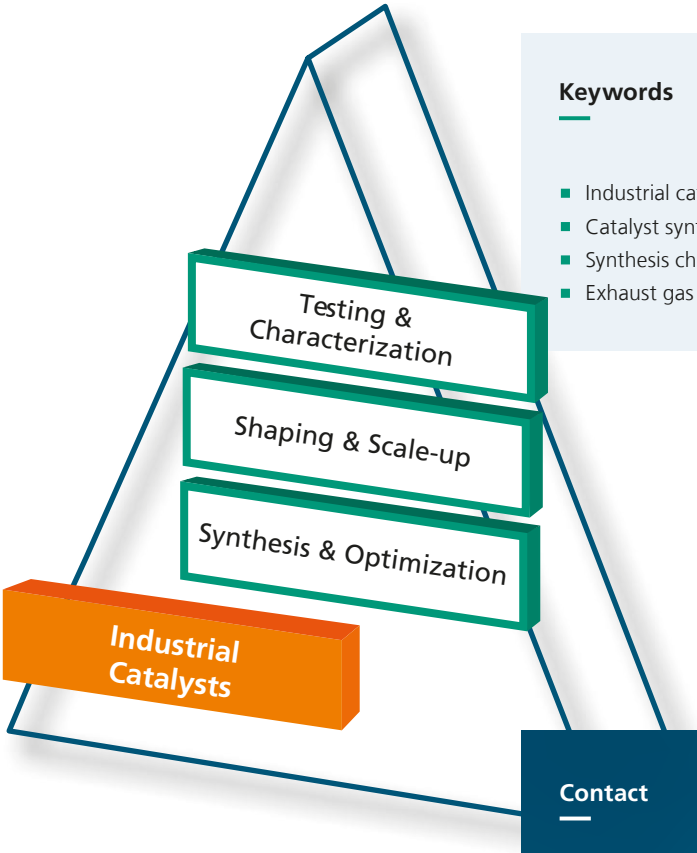
Our facilities

Synthesis plants
- Catalyst preparation from laboratory scale to first industrial scale (reactor sizes: 0.5 L, 2 L, 20 L and 200 L)

Parallel reactor system
- 8-fold parallel reactor system for rapid screening of small amounts of catalyst

Test rigs for detailed catalyst testing
- Variable gas compositions for a wide range of applications
- Tests under high pressure: up to 100 bar and 400 °C
- Systematic variation of process parameters in industrially relevant application areas

Shaping of industrial catalysts
- Extruder with different matrices for individual shaping e.g. as bulk material or as honeycomb



Keywords

- Industrial catalysts
- Catalyst synthesis
- Synthesis chemistry
- Exhaust gas cleaning

Our service

Studies
- New catalyst trends and materials

Synthesis and scale-up
- Preparation of new catalysts based on precious and non-precious metals
- Upscaling of promising catalyst formulations (up to the kilogram range)

Characterization
- Extensive equipment for the investigation of surface chemistry and structural properties (e.g. XRD, TPD, BET)

Shaping
- Production of individually shaped catalysts according to customer specifications

Screening and testing
- Identification of promising catalyst patterns
- Determination of important catalyst parameters such as conversion, selectivity and productivity under systematic variation of reaction conditions

Your benefit

We support your development process of new industrial catalysts from the first laboratory synthesis to the provision of moulded bodies for technical use. This can accelerate development cycles and save development costs.

Our service offer includes the development of both precious and non-precious metal-based catalysts and is based on many years of experience in various areas of industrial catalyst use, such as synthesis gas chemistry or exhaust gas aftertreatment.

We would be happy to prepare a customised offer for your task. Let us accelerate catalyst development together!

Contact

Dr.-Ing. Barbara Zeidler-Fandrich
Head of Department
Chemical Energy Storage
Phone +49 208 8598-1143
barbara.zeidler-fandrich@umsicht.fraunhofer.de

Dr.-Ing. Heiko Lohmann
Group Manager
Catalyst Testing
Phone +49 208 8598-1197
heiko.lohmann@umsicht.fraunhofer.de

Dr. rer. nat. Clara Watermann
Group Manager
Catalyst Synthesis
Phone +49 208 8598-1551
clara.watermann@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT
Osterfelder Strasse 3
46047 Oberhausen, Germany
www.umsicht.fraunhofer.de