

# Synthesis of catalysts for industrial application

## From catalyst powder to the optimal catalyst form

Larger quantities are required for pilotscale testing of catalysts. With our facilities, we can transfer formulations from laboratory to pilot scale. Precise transfer of all relevant process parameters to a larger scale is the decisive factor for the success of this technical process.

### Catalyst shaping and scale-up at Fraunhofer UMSICHT

Fraunhofer UMSICHT has a number of synthesis plants for the production of a wide range of catalyst compositions in different scales – starting with the production of catalyst samples in the gram range up to initial batches in the kilogram range for your pilot plants.

According to your specifications, we can produce both precious metal-containing and non-precious metal-containing catalysts. Our focus is on the preparation of new catalysts based on non-precious metals. These are

often a cost-efficient alternative to catalysts containing precious metals, with the same or improved activity and resistance to poisoning.

The shaping of catalysts is crucial for their technical use. Whether classically in bulk form or as a honeycomb – with the help of extrusion systems we can produce individually shaped catalysts according to your specifications.

The spectrum ranges from supported catalysts to functionalized catalysts (e.g. electrical conductivity) to full catalysts.

We always focus on your wishes and adapt the catalyst to your requirements.

### Industrial sectors

- Chemical industry
- Steel industry
- Cement industry
- Fuel cell manufacturers
- Engine manufacturers
- Exhaust gas aftertreatment

## Our service

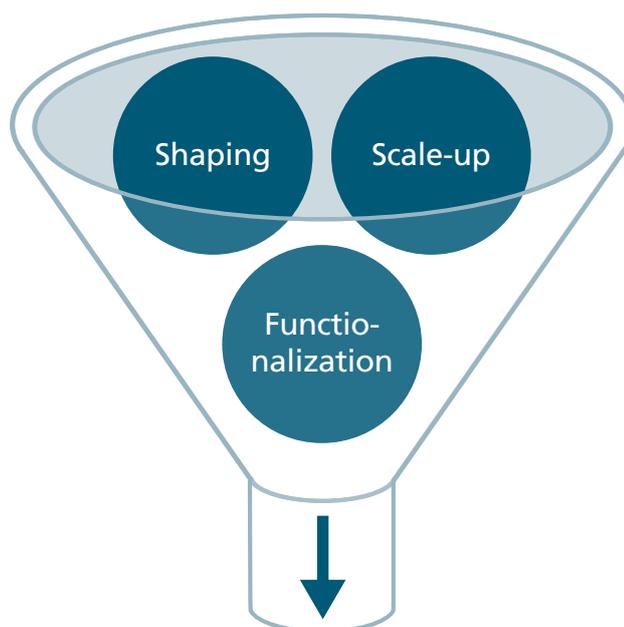
We accompany you in the preparation of new formulations as a competent research partner and can synthesize research samples using various methods. In doing so, we apply our many years of know-how and use our modern laboratory and pilot plant equipment.

No matter what stage of development you are in, we adapt our services to your individual needs. Whether at the beginning of your development, for example, to test the use of a precious metal-free catalyst, or at a later point in time to bring your catalyst sample from the laboratory to the pilot plant scale. Together with you, we develop approaches for catalyst synthesis, examine the possibilities of upscaling and develop individually shaped catalysts – be it in bulk form, as honeycomb or pellet.

With our modern laboratory equipment we can react flexibly even to unconventional preparation requests. We have synthesis plants for precipitation reactions in scales of 0.5, 2, 20 and 200 litres. Further synthesis methods and thermal post-treatment are possible in calcination furnaces with a wide gas spectrum.

We have a ceramic extruder at our disposal for the synthesis of catalyst mouldings. It can be used to extrude a wide variety of shaped bodies – e.g. as bulk material or honeycomb – up to a diameter of 20 millimeters. We develop the extrusion paste for your full catalyst tailor-made, which means that all functionalities can be individually adapted to your requirements.

All catalysts are tested by us under conditions close to the application, so that you receive a reliable statement about the performance for the later technical application.



## Optimal Catalyst

### Your benefit

The success of a technical process often depends on the precise transfer of all relevant process parameters to a larger scale. Here, the factor flexibility, which distinguishes us, is attributed an important role.

We support you scientifically in the development process of catalysts – from the first sample to the first batch on a pilot scale. In doing so, we support you both in the preparation and in the improvement of your catalyst formulation.

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

### Keywords

- Industrial catalysts
- Catalyst synthesis
- Scale-up
- Shaping

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