



**DBFZ Deutsches Biomasseforschungszentrum
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TECHNICAL FACILITIES

- Laboratory-scale unit for catalyst characterization (Activity measurements on pulverised and monolithic samples)
- Portable test facility to test specified catalysts with real exhaust gas
- Analysis laboratory
- Test stands for analysis of effectivity and stability of catalysts in small-scale biomass combustion systems
- Facility for heating of catalysts with radio-waves
- Prospective: Physi-/Chemisorption, characterisation of textural properties

Beside the research covered by resources of the Ministry for Food and Agriculture (BMEL) and other public funding also research contracts and services are offered.

SERVICES OF THE RESEARCH AREA

- Analysis of facilities including secondary exhaust gas treatment with respect to efficiency and emission (test stand and also field measurements)
- Catalyst characterisation with model gas and real gas
- Catalyst synthesis

Publications and information about the projects of the research area „Catalytic emission control“ can be found at www.dbfz.de.

With support from



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German Bundestag

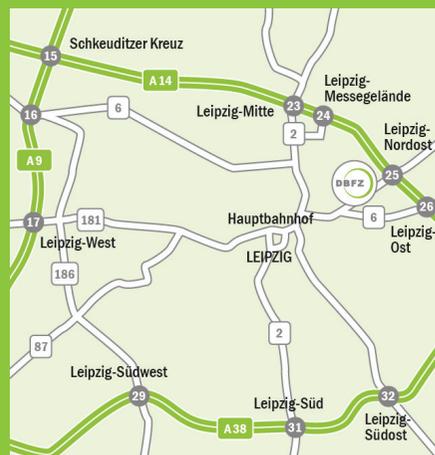


GETTING HERE:

By Train: Arrive at Leipzig Central Station; then take tram 3/3E (towards Taucha/Sommerfeld) to Bautzner Straße; cross the road, pass the car park on the right, straight ahead to the entrance of number 116, turn left after approx. 100m, and the DBFZ entrance is another 60m on the left.

By Car: Via the A14 motorway; take the Leipzig Nord-Ost exist, Taucha; towards Leipzig; head towards the centre; pass the bft petrol station and the DBFZ is on the left (see 'By Train').

By Tram: Tram 3/3E (towards Taucha/Sommerfeld); alight at the Bautzner Straße stop (see 'By Train').



RESEARCH FOCUS AREA

Catalytic
Emission Control



„Research and further development of catalytic processes to reduce emissions from combustion processes of biomass energy sources ensures the necessary environmental friendliness of bioenergy.“

(Prof. Dr. Ingo Hartmann, Head of the DBFZ research focus area “Catalytic Emission Control”)

BIOMASS ENERGY USE

The use of biomass is a crucial component of the renewable energy landscape. In the heating sector it amounts to about 90 % of the total renewable heat. There, different conversion pathways are used to fulfil the requirements of modern society. Several beneficial applications of biomass in various forms have been developed including the well-known supply of heat from small-scale combustion systems, biogas plants with combined heat and power station, micro-CHP plants, and the use of biofuels in motorised combustion.

An exhaust gas treatment to avoid pollutant emissions is necessary dependent on the type and quality of the occurring processes as well as the chosen raw biogenic material. The ecological benefit of biomass use in comparison to fossil references can only be acknowledged by guaranteeing low pollutant emission.

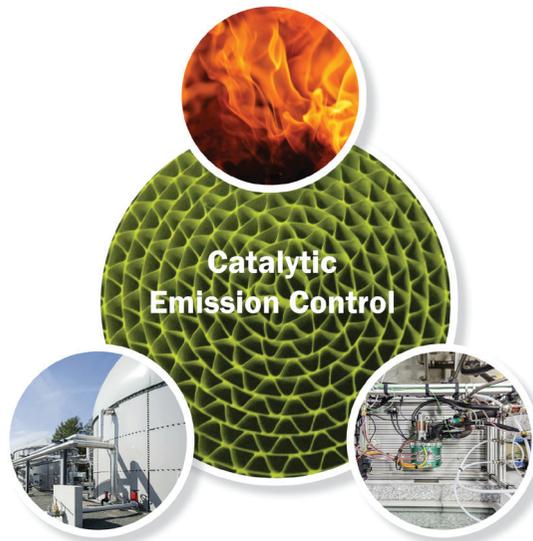
RESEARCH AREA TOPICS

- Applications in small-scale combustion systems (integrated and downstream exhaust gas purification)
- Exhaust gas purification at biogas plants with combined heat and power station
- Catalyst effectiveness on motorised applications (influence of biofuels)
- Sustainability considerations for catalysts

CATALYTIC EMISSION CONTROL

Various studies describe the threat to the natural environment as a whole and in particular to public health through the emissions of different pollutants formed in the conversion processes of biomass utilisation.

Besides the adverse effects of carbonaceous substances, volatile organic compounds, carbon monoxide, methane, carbon black, and polycyclic aromatic hydrocarbons as well as the harmful effects of chloride containing substances (HCl, PCDD/F), nitrogen oxides, and sulphur oxides are recognised. Catalytic exhaust gas purification technologies are already state-of-the-art in different areas such as the power generation and automobile sectors. The development and adaption of suitable catalysts along with adjustments of used techniques for biomass utilisation processes can further facilitate the progression of renewable energy use from biomass.



Catalytic emission control in all areas of biomass utilisation for energy production

CATALYTIC PROCEDURES

- Catalytic activated carbon black particle filter
- Catalysts for the reduction of carbon monoxide and hydrocarbons
- Selective catalytic reduction (SCR) in combination with particulate collection
- Catalytic reduction of residual methane
- Precipitation of pollutants (HCl, SO₂, PCDD/F) via precoating at fibrous filters

CATALYST DEVELOPMENT



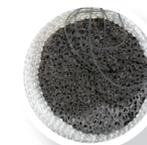
Application of biogenic silica from thermochemical reacted biogenic residues for high quality raw materials production



Highly temperature stable catalysts for the integration in combustion units



Application of mixed metal oxides alternatively to noble metal catalysts



Material modification through high-frequency electro-magnetic fields