



Andreas Junghans



# ENVIRONMENTAL AND PROCESS ENGINEERING

## Project reports

- 72 Electrochemical processes for water treatment and raw materials recycling
- 74 Membrane testing in pilot and field tests
- 76 Shockwave recycling of ceramics and ceramic noble metal composites
- 77 Photocatalytic waste water treatment with functionalized, cellular ceramics
- 78 Testing and development of DeNOx catalysts
- 79 Ceramic support structures for applications in heterogeneous catalysis

For the “Environmental and Process Engineering” business division, Fraunhofer IKTS provides materials, technologies and systems that create the transformation of materials and energy safely, efficiently, and in a manner safe for both the environment and climate. The focus here is on processes in conventional and bioenergies, strategies and processes for air and water purification, as well as recovering valuable raw materials from residual substances. Ceramic technologies enable new reactor designs for the chemicals industry.

Fraunhofer IKTS is one of the world’s top research institutions in the field of separation technology that applies ceramic materials. Materials, technology, and process expertise are all intertwined, thus enabling the achievement of complex process engineering systems for energy-efficient separation processes, chemical conversion as well as the recovery and reuse of materials. Ceramic membranes, filters, adsorbents and catalysts from Fraunhofer IKTS play an integral role in gas processing and water treatment processes. In addition, ceramic membrane processes are combined with innovative materials to make new reactor concepts.

Knowledge of process engineering for the milling, disintegration and mixing of biogenic substrates represents another core competency of Fraunhofer IKTS in the field of biochemical and thermochemical biomass conversion. At numerous laboratory and pilot facilities, the institute models, validates and optimizes fluidic, electrochemical and thermomechanical parameters used in material transportation processes and reactions. Through numerous laboratories, pilot facilities and the application centers for membrane technology as well as bioenergy, the business division possesses a superior infrastructure that allows it to realize a wide range of projects of various scopes and scales. The findings flow directly into demonstration systems that are installed at the customer’s business premises and that Fraunhofer IKTS is able to maintain.