Theresa Ludwig et al., Int J Adv Technol 2018, Volume 9
DOI: 10.4172/0976-4860-C1-003

Additive manufacturing for heterogeneous catalysis: New challenges in material and process development

Theresa Ludwig[1], **Bernhard Rieger**[1], **Richard Fischer**[2] and **Markus Tonigold**[2]
[1]Technical University of Munich, Germany
[2]Clariant Produkte (Deutschland) GmbH, Germany

Established shaping methods for heterogeneous catalysts or catalyst support, e.g. extrusion or tableting, are limited in form variations due to process constraints and cost-intensive tooling. Additive manufacturing offers a promising possibility of geometric flexible catalyst production. Nevertheless, 3D printing of functional materials defines new challenges in material and process development. The complexity of their process chain includes an intense material study, process adaptions, a thermal post-processing step and catalytic testing, which provides restrictions through specifications of the chemical reaction. As the avoidance of interfering substances is crucial for catalytic applications, additive processing materials have to be carefully selected. In contrast to high-performance ceramics, those functional materials are mainly requiring high specific surface areas with sufficient mechanical strength. Some catalyst materials may also change their state of phase during heating. Against this background, this research has to consider the process chain in its entirety, but still examine all steps in detail.

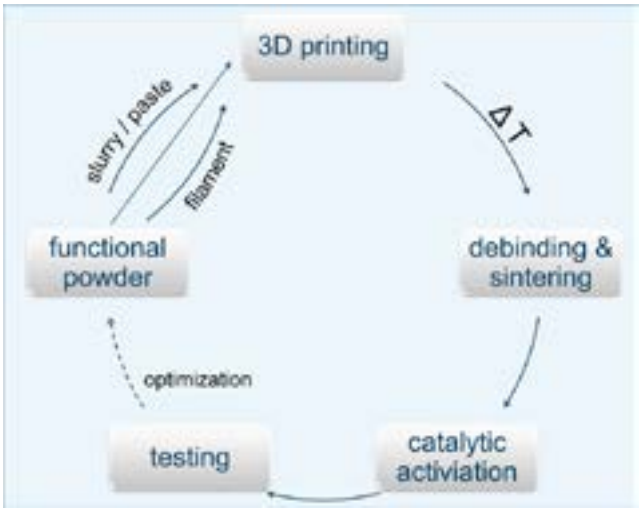

Figure 1: *Process chain for 3D-printing of functional materials.*

Biography

Theresa Ludwig has completed her BSc and MSc Degree in Chemistry at the Technical University of Munich in Germany. Currently, she is pursuing her PhD at the WACKER Chair of Macromolecular Chemistry (Chemistry Department) in the same university under Prof. Dr. H C B Rieger in industrial collaboration with Clariant AG, Switzerland. Her research interest includes 3D printing of functional materials, heterogeneous catalysis, ceramic and polymer processing.

theresa.ludwig@makro.ch.tum.de