# Special Issue

# In-Situ Characterisation of Heterogeneous Catalysts and Energy Materials

## Message from the Guest Editor

In-situ transmission electron microscopy has established itself as a reproducible state-of-the-art technique for the study of materials in real time. The ability to study the dynamic behavior of a catalytically active material during reaction conditions has provided a major step towards understanding catalytic activity and its evolution over time. Nowadays, two different systems are used for in-situ microscopy: on the one hand, dedicated in-situ environmental transmission electron microscopes (ETEM) with a differentially pumped objective lens enable a window-free imaging of the sample in question, and are limited to several 10 s mbar of pressure; on the other hand, mems-based in-situ TEM holders which allow pressures of up to 1 bar within the cell. In-situ microscopy and so called “operando” microscopy allow for correlating the dynamic changes the catalyst undergoes to variations in the catalytic performance. Submissions to this special edition are welcome in the form of original research papers which utilize in-situ gas or liquid systems to better understand catalysts and/or energy materials by means of microscopy or spectroscopy techniques.

## Guest Editor

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## Deadline for manuscript submissions

closed (30 September 2021)

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## Editor-in-Chief

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