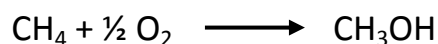




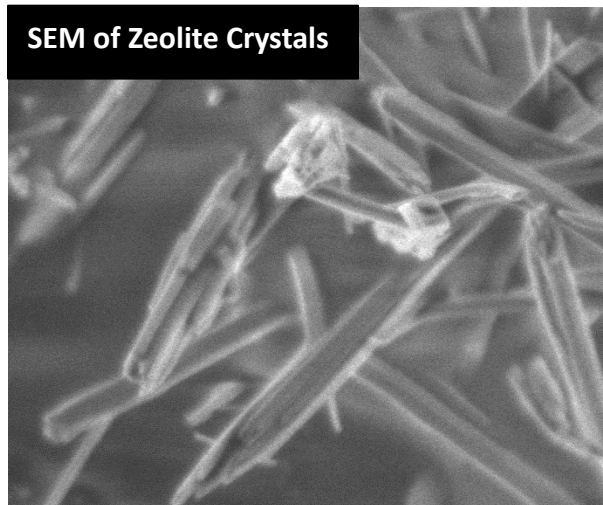
## Zeolite Catalysts for the Methane Oxidation

### Motivation and challenge

In the near future, the increasing affords to reduce CO<sub>2</sub>-emissions will lead to a growing replacement of mineral oil as basic for the petrochemical industry. The direct conversion of Methane into methanol in small production units would reduce the emissions and costs of natural gas conversion dramatically. The focus of the project is therefore the investigation of zeolite structures for the stoichiometric reaction:



SEM of Zeolite Crystals



### Objectives and scope

The project is located within the development of new heterogeneous catalysts based on zeolite and zeotype frameworks and their application in the direct natural gas oxidation. Through a systematic approach, interesting zeolite structures shall be synthesized and exchanged with Copper, to generate the actual catalyst.

All catalysts will be characterized by state-of-the-art techniques. Also advanced characterization methods are available. All catalysts will additionally be tested in a professional test rig. This way, a student will learn how to develop catalysts, from the actual idea to the final application in a reaction.

### Skills to be developed

- Synthesis of heterogeneous catalysts based on zeolites
- Application of standard characterization techniques, as they are used in the industry (Physisorption, X-RAY Diffraction, SEM, TPD)
- Conducting reactions on a professional test rig.

### Contact information

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