

Development of Industrial Applicable Methods for Synthesis of Mesoporous Zeolite Catalysts

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Catalysis is a main tool towards a more sustainable chemical industry. A cleverly designed catalyst, allows important reactions to happen with less waste of precious resources, and a possible decrease in toxic reagents.

Zeolites are a widely used group of catalysts, which are crucial in today's carbon-based chemical industry, e.g. production of medicine, fuel, and plastic. However, the inherent microporosity of zeolites results in an unacceptably slow diffusion of reactants and products inside the zeolite. This causes low activity, and a possible deactivation of the catalyst.

Many strategies to overcome this challenge have been proposed. None have however proved to be feasible for industrial application, as they require costly reagents or are time consuming.

Here, we present a versatile method for the preparation of zeolites with an additional mesoporous system to overcome the mass transfer challenge. This is done using a cheap and readily available *In situ* generated carbon template. During the project, a method was developed to synthesize several types of different mesoporous zeolite catalysts. In addition, the materials were characterized, as well as tested in an industrial chemical reaction to fully evaluate the developed method.