

Characterization of Catalysts for Synthesis of Higher Alcohols using Electron Microscopy

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The increasing interest in developing transportation fuels from sustainable resources demands new and better production paths. One of these is using biogas to create alcohol as a fuel. Higher alcohols are favorable due to the higher energy density and the facile application in today's internal combustion engines. However, the poor yield of higher alcohols in the chemical reactions creates demand to find better catalysts for these applications [1].

Transmission electron microscopy is a valuable tool for characterization of various materials including catalysts. However, conventional TEM does not provide dynamic information of the catalysts in their working state.

Our recently installed Environmental Transmission Electron Microscope (ETEM) is equipped with a gas inlet system for various reactive gases. Together with a heating holder, it enables us to study catalysts with TEM methods while they are working [2],[3].

The catalysts for sustainable energy project (CASE) at DTU aims at predicting potential new catalysts with density functional theory and testing the chemical reactivity to identify the most promising. The aim of this Ph.D. project is to characterize these new candidates by electron microscopy.

This poster covers the principle methods we are going to apply together with first results of CuSn supported on Al₂O₃.

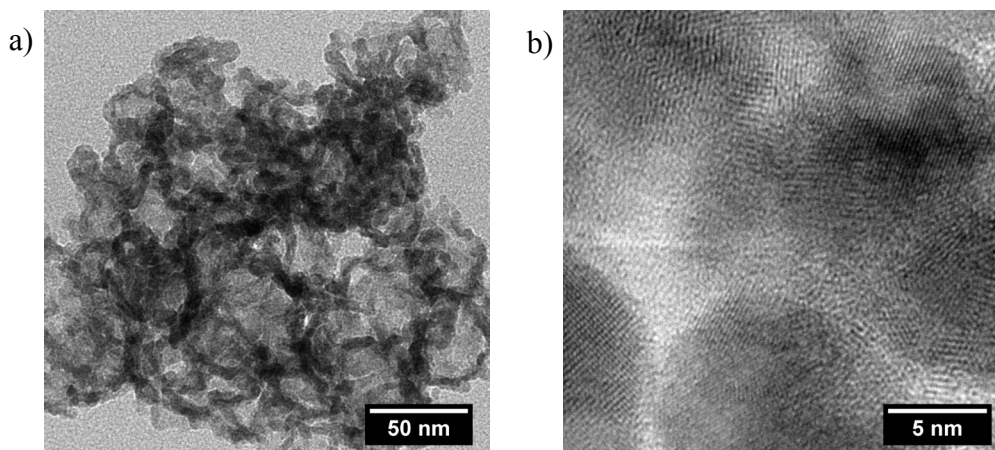


Fig.1: a) Overview image and b) High resolution bright field image of nanoparticles in CuSn on Al₂O₃.

References

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