



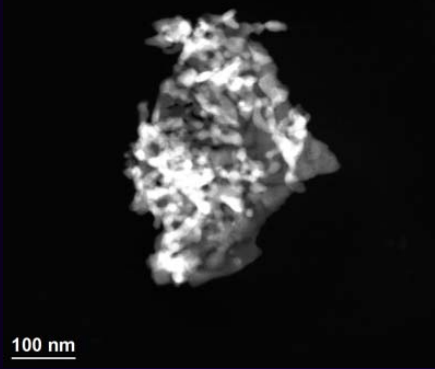
3-D Quantification of Catalysts in a Reducing Environment



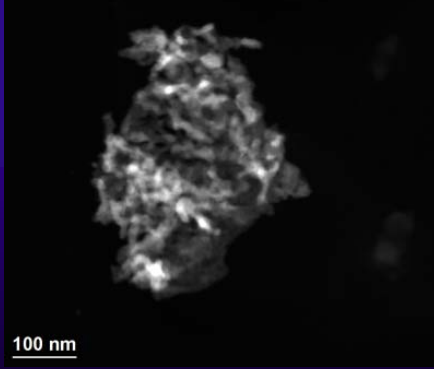
Ilke Arslan, Department of Chemical Engineering and Materials Science, University of California at Davis

Fischer-Tropsch (FT) catalysts are heavily researched because they are used to create a petroleum substitute from carbon monoxide and hydrogen, also known as synthesis gas, which can then be used to create a synthetic fuel. We aim to examine the fundamental nanoscale mechanisms controlling the FT process by using a combination of 3-D imaging and in-situ/ex-situ gas experiments in the scanning transmission electron microscope (STEM). **To date, we have identified that the 3-D morphology of FT catalyst changes as a function of reduction, which can be seen in the scanning transmission electron microscope images below. Reduction was assessed using electron energy loss spectroscopy as shown on the bottom right. Further, we have verified that beam damage and/or contamination are not present and will therefore not affect our results.**

0 min reduction



5 min reduction



10 min reduction

