Supervisor's review of diploma thesis

Student: Bc. Svetlana Kurucová

Thesis title: Applications of hydrogenation catalysts prepared by reductive demetallation of zeolites

Svetlana Kurucová started working on the presented thesis straight after completing her Bc. degree. The topic of the thesis is different from that of bachelor thesis. The broad aim of the thesis was to investigate catalytic abilities of metal@zeolite composite catalysts with bimetallic active phase, prepared by so-called reductive demetallation. The reductive demetallation is a novel method of making such materials, which was recently developed in our group. The catalysts with CuFe and CuZn active phases were intended for hydrogenation catalysts.

The thesis contains a study on 2 different active phase compositions, 3 hydrogenation reactions and 3 different zeolite topologies used, all these compared to a number of reference catalysts prepared by conventional methods. Looking back, this is rather broad scope which makes the thesis in some parts difficult to follow and probably I should have narrowed the scope from supervisor's position. On the other hand, initially Svetlana had to start with a broad screening since there was a possibility the demetallated catalysts will be inactive in some of the reactions (the only proof-of-concept was the activity of CuFe@MFI catalysts in hydrogenation of -NO2 group) and in the final stage we decided to include all the amount of work Svetlana did.

Svetlana did considerable amount of work on investigation of the hydrogenation catalysts prepared by reductive demetallation and her data will serve as a basis for scientific paper, which is now in preparation with intention to be published in a Q1 journal such as Catalysis Today. The thesis has certain reserves in describing structure-activity relationships of the catalysts (from a strictly scientific viewpoint); nevertheless, considering this is a Master student's work, its level is in my opinion above average.

Regarding the assessment of the thesis using antiplagiarism tool Turnitin, the thesis exhibits overall similarity index 25% which is a low value and represents mostly formal parts of the thesis, field specific terms and definitions, and description of the of the used instrumentation in the experimental section. I have been following drafts of the thesis and I can confirm the thesis is original.

Overall, I am satisfied with the collaboration with Bc. Svetlana Kurucová as well as with the quality of the submitted thesis. Therefore, **I recommend the thesis for defence and I suggest "A" score for the thesis.**

In Prague, 26th May 2023

Ing. Jan Přech, Ph.D.

Thesis supervisor.