

## Review of Bc. Svetlana Kurucová master thesis

The master thesis of Bc. Svetlana Kurucová is aimed at the application of hydrogenation catalysts prepared by reductive demetallation of zeolites. Reductive demetallation is a new process for forming metal nanoparticles in the zeolite structure with homogeneous distribution. Such materials might be promising in many applications due to their specific properties connected with the zeolitic (strongly acidic) support.

The student has chosen three types of zeolites, three metals, and three hydrogenation/hydrogenolysis reactions for testing. The reduction of parameters would increase the clarity of the thesis. Nevertheless, the amount of work done by student is impressive and deserves appreciation. The theoretical part contains minimum type errors and acquaints the reader with the topic.

The experimental part describes the synthesis of the catalysts, characterization methods, and catalytic experiments. The procedures are well-defined, and all processes can be repeated. I need clarification on why different methods are applied in some cases, e.g., different reduction conditions? Are these based on literary data or preliminary experiments?

The result and discussion part is standardly divided into the characterization and catalytic part. The student worked a considerable amount of experimental work; however, as mentioned above, I was sometimes lost, especially in the number of catalysts used, and sometimes the work evoked me as a list of experiments. The discussion of the correlation between the catalysts' structural properties and catalytic activity took a lot of work to detect. Still, such discussion was present, and the student tried to explain the obtained data. This part was also written with great attention and low type errors or inaccuracies (e.g., "...conversion of the BEA catalysts..."). For her future work, I would recommend avoiding point chaining in Excel software as it draws a shape of curves that are not supported by experimental data. It would help if you also avoided lumping together all (especially) noble metal catalysts based on the results obtained using one of them (Pd/alumosilicate) because noble metal catalysts with specific properties are also used. The questions for the discussion:

- 1) Why were MFI, BEA, and VET zeolites chosen?
- 2) Why was the correlation (response) coefficient not used in the case of substrate?
- 3) Was the reduction of Zn in, e.g., CuZn@MFI catalyst, observed (Figure 16)?
- 4) In Figure 26, the simulation of high conversion was performed. How were these experiments carried out? From the figure showing the desired behavior of CuFe@MFI, it seems that this catalyst was inactive in hydrogenation as it was impossible to achieve total conversion of ethynylanisole. Can you comment on this?
- 5) In Figure 27 and in the text, the properties of catalysts CuFe@MFI and Cu@Al-MFI are compared based only on the presence or non-presence of Fe. Is this possible?

To summarize, the master thesis of Bc. Svetlana Kurucová contains an impressive amount of experimental results supported by a discussion, accompanied by the low amount of type errors.

**I recommend the master thesis for the defense with a grade A.**

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