

Bachelor Thesis Review

Faculty of Mathematics and Physics, Charles University

Thesis author: Nikola Cigániková

Thesis title: Probing the activation of organic molecules using the low-energy electron diffraction

Study program: Physics

Study branch: Physics

Year of submission : 2024

Review author: Llorenç Albons Caldentey

Department: Surface science and plasma

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Professional level of work:

excellent very good average below average unsatisfactory

Material errors:

almost none given the scope reasonable number less significant numerous serious

Results:

original both original and adapted non-trivial compilations quoted from literature
 from literature without quotation

Scope of work:

large standard sufficient insufficient

Graphical, linguistic and formal level:

excellent very good average below average unsatisfactory

Typos:

almost none given the scope and topic a reasonable number numerous

Overall level of work:

excellent very good average below average unsatisfactory

Verbal statements, comments and observations of the reviewer:

This is an ambitious work where the student had to both design a custom device and procedure for sample preparation, and learn about the relatively challenging LEED technique. Interesting results are presented and although they were ultimately not successful in preparing the activated molecules' reconstruction, the work was well thought and structured and it seems worth continuing outside of the limited time frame of a bachelor thesis.

Aside from the science presented, I would like to comment that it would be nice to have size scales inside the images and not only the information about how big the image is written on the caption. Specialty in figures where one would like to compare sizes like Figure 1.4.

Finally, there are some grammatical and formal errors which should be improved in future works. However, I would find it unreasonable to ask for a bachelor student who is not a native English speaker to write perfectly and therefore, combined with the scientific level of the work, I find the overall level of the thesis to be excellent.

Possible questions during the defense and topics for discussion:

During the Si substrate annealing it is mentioned that both current polarities were run through the sample. Why is this necessary for temperature homogeneity?

What are the optimal conditions that you found for the Si-In $\sqrt{3}\times\sqrt{7}$ reconstruction? Was the surface nicely reproducible with those conditions?

You say that there is a strong probability that you could not activate a large part of the molecules with the activator device. If that were to be the case, do you have any ideas of how the device be modified to improve the activation rate?

Work

I recommend the thesis to be accepted.

OR

I don't recommend the thesis to be accepted for the reason...

I suggest the grade:

excellent very good good failed

Location, date and signature:

In Prague, 30/05/2024