



THESIS EVALUATION OPPONENT EVALUATION

Author name: Ondřej Havelka

Thesis title: Laser-generated synthesis of Pd-Ni nanoalloys usable as catalysts

Opponent: Dr. René I. Rodríguez-Beltrán

Opponent workplace: CONACYT-CICESE Unida Foránea Monterrey (Mexico)

- A. Abstract quality, keywords matching Excellent (1)
- B. Research scope and processing Excellent (1)
- C. Level of theoretical part Excellent (1)
- D. Appropriateness of the methods Excellent (1)
- E. Results elaboration and discussion Excellent (1)
- F. Students own contribution Excellent (1)
- G. The conclusion statement Excellent (1)
- H. Fulfillment of Thesis tasks (goals) Fulfilled
- I. Structure, correctness and fulness of references Excellent (1)
- J. Typographical and language level Excellent (1)
- K. Formal quality Excellent (1)
(text structure, chapters order, clarity of illustrations)

Comments, remarks:

In this work, Ondřej Havelka presents the synthesis of Ni-Pd nanoalloys by using laser ablation in liquids for its possible exploitation in the catalysis field. As a general overview, it is a well-structured document, where the author identifies how the limitations or disadvantages of previous approaches are overcome to deal with the selected problem or need. Also, it is found clear and concise writing, with an appropriate organization of the ideas, good spelling, grammar, and citing.

The solution used to solve the problem is described, justifying it conceptually. So, methods and materials are consistent with this proposed solution and the available resources, demonstrating the correct use of disciplinary knowledge and skills. Finally, there is coherence between the results and the methods.

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Overall assessment:

The thesis is an original and significant contribution to the material science area. Mainly, it presents the laser material processing as an excellent and green alternative for the nanostructuring of metallic materials. The results are helpful and recommended for a peer-reviewed publication.

About the author, it is important to emphasize his participation in several scientific contributions (Pag. 84).

Questions for the defense:

1. In Pag. 31, the author argues that "the most effective lasers for LAL are those with ... from kHz to several MHz". What would happen if I use a laser with a lower repetition rate, e. g. Hz? Should I adjust the other laser parameters?
2. About your irradiation experiments, how do you calculate the Fluence?
3. Do you imagine what would happen if you use a lower wavelength?
4. Do you think it is possible to predict perfect Pd-Ni nanoalloys by estimating the plasmon resonance versus the nanoparticle size?
5. Could you mention another application for this kind of NPs?

Overall classification and recommendation:

Work meets the Master degree requirements and therefore I recommend it for the defense
I suggest to classify this work by grade: Excellent (1)

By signing I certify that I am not in any personal relationship with the author of the thesis _____

In Apodaca, N.L., México

date 01/06/2021

Opponent signature

