

Interactive comment on “Open-source, 3D-printed, high-pressure (50 bar) liquid-nitrogen-cooled para-hydrogen generator” by Frowin Ellermann et al.

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Dear Eleonora Cavallari,

Thank you very much for your review! First of all, we implemented all your comments. Hereby, we provide a point-by-point response to the critics provided.

Your comment: "I find the title misleading, reading it I thought the authors provided a printable 3D-model of the parahydrogen generator, therefore I suggest to modify it."

C1

Answer: We got the same feedback also from other referees and the new title now reads as follows:

New title: "Open-source, partially 3D-printed, high-pressure (50 bar) liquid-nitrogen-cooled parahydrogen generator"

Your comment: "The cotton wool filters used to protect the system from catalyst contamination it could be better described."

Answer: We agree that the information about the wool was not detailed enough. That's why we added more information now.

Old text (e.g.): "In both ends of the coil, the cotton wool was pressed to keep the catalyst in place and protect the rest of the system from contaminations."

New text: "On both ends of the copper coil, cotton wool was pressed to keep the catalyst in place to protect the rest of the system from contaminations. The compressed wool insets have a length of 20 mm. Wool as a particulate filter was used before in another PHG (Du et al., 2020). During the six months of weekly use of our generator, there was no sign of a moving catalyst."

Your comment: "It would be interesting to know the life time if the cylinder had been vacuumed or even washed with H_2/pH_2 before being filled with pH_2 , in order to verify that the value obtained using this generator is comparable with those reported previously."

Answer: We changed the sentence concerning the vacuuming since we did not investigate it. The life-time of pH_2 does not depend on PHG but purity of the storage bottle. See production protocol stage 2: Flushing storage bottle. It is the only cleaning procedure that was used.

Old text: "Note, that we did not vacuum our cylinder that can increase the lifetime."

New text: "Note, that we did not perform any dedicated cleaning procedure for the bottle. Still, the lifetime is sufficiently long to produce pH_2 once a week."

C2

Your comment: "I don't understand the meaning of "points loss of f_{pH_2} . Is this value related in some way to the polarization obtainable (13) with respect to $f_{pH_2} \approx 100$ %? The authors should rephrase the sentence to clarify this concept and/or add the formula that defines it."

Answer: Actually, it was another way to present the lifetime. However, it was confusing other referees, too. Therefore, we decided to remove it completely since it does not contain any additional information.

Thank you again for your positive review! We hope, that we could adapt your comments as intended.

With kind regards,
Frowin Ellermann and Jan-Bernd Hövener

Interactive comment on Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2020-27>, 2020.