

Magn. Reson. Discuss., referee comment RC1
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Comment on mr-2021-57

Anonymous Referee #1

Referee comment on "A cryogen-free, semi-automated apparatus for bullet-dynamic nuclear polarization with improved resolution" by Karel Kouřil et al., Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2021-57-RC1>, 2021

"general comments"

The manuscript presents an upgraded version of the "bullet" Dissolution DNP setup previously introduced by the same group. The previous setup suffered from lower resolution issues apparently due to the presence of bubbles in the sample's tube. It also consumed significant amount of He while necessitating significant cleanup. In the upgraded version, the setup is significantly improved. The linewidth is now reasonable (~3ppb), the Helium consumption is lower and most of the steps are automatic.

The manuscript is in general well written and provides a high level of details if one wants to reproduce the setups which is appreciable. The bulletin is thus publishable after minor modifications.

"specific comments"

#1 I may have misunderstood something, but you wrote that 3 lines are connected to the lid of the reservoir, but on figure 2 (left) I only see 2 of them (plus the bullet "intake"). Either this is incorrect or description line 125 is not clear; I do not see the line to add a different solvent.

#2 The material used to make the bullet is not described in section 2.5 but can be inferred later (PTFE is mentioned in discussion). Would a different material be more suitable?

#3 How long is the DNP irradiation applied for? You mention a limit of 10 shoots / hour but that also depends on the duration required to build the nuclear polarization.