Interactive comment on “Isotopic evidence for biogenic molecular hydrogen production in the Atlantic Ocean” by S. Walter et al.

S. Walter et al.

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Dear referee, thanks for your comments. Please find our reply in-line. Kind regards, S. Walter

p. 16441 l. 16-17: How exactly was the value of 92 % for the extraction efficiency determined? Is this a mean for all samples? What was the variability for the whole dataset? Reply: the mean value is 92.12 (±0.013)%. Due to the very low variation we mentioned just one value without decimal places. We included this to the manuscript for completeness.

p. 16448 l. 13-15: Please detail planned/recommended improvements and expected impact on measurements. Reply: The possible improvements include a better monitor-
ing of additional data such as temperature and pressure in the vessel itself, this was not possible yet. As already mentioned in chapter 2.3, the temperature dependence of the H2 solubility is quite low with less than 0.3% per K, and also the used pressure sensors (Omega, PAAR21R) work within a low error range of 0.5% or even below. In combination with the high extraction efficiency and the standardized sampling procedure over the two cruises, we are convinced that the presented data sets are reasonable. A more detailed discussion about uncertainties and their effect on the results has been added to the manuscript (see also reply to referee #1).

p. 16452 l. 21: Ist he global nitrogen fixation rate of 175 TgN a-1 a result from the GEMS database? Reply: This was a typo, it should have been the value given by Großkopf et al. (2012). The value has been corrected.

Table 2: Why were samples excluded? Were there any issues with the sample handling or contamination? Reply: 5 samples out of almost 200 were excluded as outliers (>2 σ), however, we do have no explanation for the deviation. There was no indication for sampling or measurement errors.

Technical comments Consider reporting saturations in % instead of saturation factors/supersaturation throughout the manuscript to facilitate comparison with other publications. Reply: we changed the supersaturation factor to saturation.

Table 4: Caption differs from table headings for xh/xm, Da/dDa and Dh/dDm Reply: This has been corrected.

Supplement p. 2: Format citation for Green Carritt, 1967, add full reference to supplement. Reply: the full reference has been added and formatted

Supplement p. 4: Add full reference for Knox et al., 1992. Reply: the full reference has been added

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