

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-

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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: Is the 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 Grobkopf 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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