

Dear Sami Jannin,

During proof-reading, we noticed many minor wording issues and we tried to address all of them at this stage. However, we also want to change three paragraphs in order to avoid any misunderstandings. Please notice, they don't alter the message of the manuscript. In the following, we want to introduce these changes.

### 1. Caption of Figure 9 (Page 8)

**Original text:** “**pH<sub>2</sub> lifetime in a 2 L aluminium cylinder.** The data is fitted with the exponential decay function:  $A_1 \cdot \exp(-t/\tau) + y_0$  with  $y_0$  fixed to 25,  $A_1 = 26.6 \pm 0.3$  and a resulting relaxation decay time of  $\tau = (35.5 \pm 1.5)$  days.”

**New text:** “**pH<sub>2</sub> lifetime in a 2 L aluminium cylinder.** After production, 5 samples of pH<sub>2</sub> were taken from the cylinder (day 0, 1, 7, 15 and 21) and quantified (squares). An exponential function  $A_1 \cdot \exp(-t/\tau) + y_0$  with  $y_0 = 25$  (red line) was fitted to the data and yielded  $A_1 = 26.6 \pm 0.3$  and a decay constant of  $\tau = (35.5 \pm 1.5)$  days.”

**Comment:** We specified the data acquisition and changed the presentation of fitting parameters. The content itself was not altered.

### 2. Production protocol “Finishing production of pH<sub>2</sub>” (Page 5)

**Original text:**

4: *Finishing production of pH<sub>2</sub>:*

- Close storage bottle (bottle valve)
- Set valve A6 to “vent” position to reduce pressure in the output line
- Disconnect storage bottle from the output (fast connect adapters keeps line closed)
- Set valve A6 to “close” position
- Close H<sub>2</sub> supply

**New text:**

4: *Finishing production of pH<sub>2</sub>:*

- Close storage bottle (bottle valve)
- Close H<sub>2</sub> supply
- Set valve A6 to “vent” position to reduce pressure in the output line
- Disconnect storage bottle from the output (fast connect adapters keep line closed) and connect an evacuated bottle or a bottle with a low H<sub>2</sub> pressure.
- Set valve A6 to “fill” position.
- Ensure that the PHG is left with 2 – 5 bar of H<sub>2</sub>

**Comment:** We modified this section to ensure the safety of the generator and the user. Now we are explicitly saying that the generator shouldn't be left at high pressure. Furthermore, a connected evacuated bottle gives room for the hydrogen gas to expand when the PHG warms up after usage.

### 3. First sentence of conclusion (Page 9)

**Original text:** “The presented PHG provides  $f_{pH_2} \approx 52\%$  at a high pressure of 50 bar reliably (CV = 1.7 %) that provides about 1/3 of the polarization achieved with  $f_{pH_2} \approx 100\%$ . Because the device provides high-pressure  $pH_2$ , however, this effect can be partially compensated in the PHIP/SABRE experiment.”

**New text:** “The presented PHG enables the production of  $pH_2$  with  $f_{pH_2} \approx 52\%$  at a high pressure of 50 bar reliably (CV = 1.7%), providing about one-third of the polarization achieved with  $f_{pH_2} \approx 100\%$ . Because the device delivers high-pressure  $pH_2$ , however, this effect can be partially compensated in the PHIP/SABRE experiment.”

**Comment:** We rephrased the first two sentences of the conclusion to avoid an overuse of the word “provide”.

We are convinced that these modifications improve the manuscript and don't alter the overall message of these sections. We kindly ask you, to introduce them.

Sincerely,

Frowin Ellermann and Jan-Bernd Hövener