Correction

Correction: Michielsens, I., et al. Altering Conversion and Product Selectivity of Dry Reforming of Methane in a Dielectric Barrier Discharge by Changing the Dielectric Packing Material. *Catalysts* 2019, 9, 51

Inne Michielsens, Yannick Uytendhouwen , Annemie Bogaerts and Vera Meynen

Department of Chemistry, University of Antwerp, Universiteitsplein 1, B-2610 Wilrijk, Belgium;

Inne.michielsens@gmail.com (I.M.); Yannick.uytendhouwen@uantwerpen.be (Y.U.);

Annemie.Bogaerts@uantwerpen.be (A.B.)

* Correspondence: vera.meynen@uantwerpen.be

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We have found some inadvertent errors in our paper published in *Catalysts* [1]. Amendments need to be made to Figure 1 and the sentences referring to the comparison of CO₂ conversion in DRM (dry reforming of methane) versus the previously published CO₂ splitting data [2]. Indeed, there were some mistakes in the datapoints in the original Figure 1, referring to previously published results from CO₂ splitting [2], caused by copy-pasting datapoints in the layout of the figure, with incorrect ordering of the datapoints. The datapoints on CO₂ conversion in DRM, as obtained for the original article [1], were however correct and remain unaltered.

Figure 1. CO₂ conversion for different sphere sizes and materials, compared to the results for the non-packed reactor, at the same flow rate (50 mL/min) and at the same residence time (5.52 s; flow rate of 192 mL/min), all at 23 kHz frequency, in a 4.5 mm gap and a set 100 Watt power for both DRM (dry reforming of methane) and pure CO₂ splitting. The bars with pattern fill show the results for DRM, whereas the full bars show the correct results for CO₂ splitting, obtained from our previous work [2].

The corrected Figure 1 should be as follows:

In Figure 1, all datapoints with full bars, referring to CO₂ splitting data from [2], have been corrected, except for two values that were correct (1.25–1.4 mm ZrO₂ and 2.0–2.4 mm BaTiO₃).

To show the numerical data, the differences between the mistake in the datapoints and the corrected data from Figure 1 are provided in Table 1.

Table 1. The correct datapoints of CO₂ conversion in the CO₂ splitting reaction from [2] (green corrected data column) in relation to those that were mistakenly put (previous data with error) in Figure 1. Those that cause the largest differences are marked in red.

Material	Size (mm)	Corrected Data	Previous Data with Error
		CO ₂ Conversion (%)	CO ₂ Conversion (%)
ZrO ₂	1.25–1.4	6.32	6.32
SiO ₂	1.25–1.4	6.13	5.60
α-Al ₂ O ₃	1.25–1.4	8.51	8.49
BaTiO ₃	1.25–1.4	15.61	6.13
ZrO ₂	1.6–1.8	5.60	3.78
SiO ₂	1.6–1.8	3.78	4.98
α-Al ₂ O ₃	1.6–1.8	9.65	8.51
BaTiO ₃	1.6–1.8	16.56	9.65
ZrO ₂	2.0–2.4	8.49	19.37
SiO ₂	2.0–2.4	4.98	15.61
α-Al ₂ O ₃	2.0–2.4	19.37	16.56
BaTiO ₃	2.0–2.4	19.77	19.77

Besides Figure 1, also some parts of the text need to be amended, where a comparison is made between the data of CO₂ conversion in DRM (dry reforming of methane) versus the corrected CO₂ splitting data [2], based on Figure 1.

In the text, the sentence on page 16, in penultimate paragraph, “Our experiments clearly reveal that the absolute CO₂ conversion is also higher for DRM than for CO₂ splitting, with the exception of BaTiO₃ and 2.0–2.24 mm ZrO₂ packing” should read, “Our experiments clearly reveal that the absolute CO₂ conversion is also higher for DRM than for CO₂ splitting, with the exception of BaTiO₃”.

In the text, the last paragraph of Section 2.1 on page 16, starting with, “For DRM in the packed reactor, the CO₂ conversion is always higher when using SiO₂ and α-Al₂O₃ packing materials . . . ” should read, “For DRM in the packed reactor, the CO₂ conversion is always higher when using SiO₂, ZrO₂ and α-Al₂O₃ packing materials than for pure CO₂ splitting. However, the enhancement of the CO₂ conversion due to CH₄ depends on the size and chemistry of the spherical packing material. Finally, CH₄ addition has a clearly negative effect on all BaTiO₃ packing materials. Thus, although BaTiO₃ in general performs best for CO₂ splitting, compared to the other packing materials, it yields the worst results for DRM”.

In the text, the sentence on page 25, in penultimate paragraph preceding the Materials and Methods, starting with “Nevertheless, the above reasoning is only a first hypothesis, as other materials exhibiting a lower CO₂ conversion in case of DRM versus pure CO₂ splitting (i.e., ZrO₂ with bead size of 2.0–2.24 mm) . . . ” is no longer necessary as the ZrO₂ splitting data do not present lower CO₂ conversion in DRM versus pure CO₂ splitting in the corrected Figure 1, which thus eliminates the anomaly in our theory. Of course, it is still true that further experiments and extensive modeling are needed to substantiate the results further. The text should thus read: “Nevertheless, this is still a hypothesis which needs further experimental and modeling proof to substantiate it and reveal the underlying mechanisms”.

We regret that the comparative data for CO₂ splitting from the previous publication [2] in Figure 1 were represented in the wrong way. However, all new data on DRM were correct. Fortunately, this error has no impact on the overall results and/or conclusions reported in the original paper and it even

solves some deviation in our hypotheses. Hence, the conclusions made in the original paper remain valid. We apologize for any inconvenience caused to the readers.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Michielsens, I.; Uytendhouwen, Y.; Bogaerts, A.; Meynen, V. Altering conversion and product selectivity of dry reforming of methane in a dielectric barrier discharge by changing the dielectric packing material. *Catalysts* **2019**, *9*, 51. [[CrossRef](#)]
2. Michielsens, I.; Uytendhouwen, Y.; Pype, J.; Michielsens, B.; Mertens, J.; Reniers, F.; Meynen, V.; Bogaerts, A. CO₂ dissociation in a packed bed DBD reactor: First steps towards a better understanding of plasma catalysis. *Chem. Eng. J.* **2017**, *326*, 477–488. [[CrossRef](#)]

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