

Correction to “Photocatalytic Water Splitting with Suspended Calcium Niobium Oxides: Why Nanoscale is Better than Bulk – A Kinetic Analysis”

Erwin M. Sabio, Rachel L. Chamousis, Nigel D. Browning, and Frank E. Osterloh*

J. Phys. Chem. C 2012, 116 (4), 3161–3170. DOI: 10.1021/jp209006n

In the original manuscript, eq 1 calculates the overall electronic rate ER [mol s⁻¹ cm⁻³] as the product of the individual rates for e/h generation, charge transport, redox reactions, and so on. This is physically impossible, as it can lead to ER values that are several times larger than the net electron/hole generation rate $R_G - R_R^L - R_R^S$. The corrected eq 1 is shown below. Instead of calculating the overall catalytic rate as a product of the individual ones, ER is given by the inverse sum of the inverse individual rates. This is equivalent to the overall *conductance* of an arrangement of conductances connected in *series*.

$$\text{ER} = \left(\frac{1}{R_G - R_R^L - R_R^S} + \frac{r}{J_{\text{CT}}^-} + \frac{r}{J_{\text{CT}}^+} + \frac{d_{\text{OX}}}{J_{\text{OX}}} + \frac{d_{\text{RED}}}{J_{\text{RED}}} + \frac{1}{R_{\text{OX}}} + \frac{1}{R_{\text{RED}}} \right)^{-1} \quad (1)$$

Now, the overall ER is limited by the smallest individual rate in the series. For example, if the electron transfer rate from the semiconductor interior to the interface is rate limiting, then r/J_{CT}^- becomes the largest argument in the denominator of the equation. Then, all other arguments can be neglected, and eq 1 transforms into $\text{ER} = J_{\text{CT}}^-/r$, in agreement with the one-dimensional continuity model expressed in Figure 8 of the manuscript.

This correction does not affect the data or conclusions in the manuscript.

■ ACKNOWLEDGMENTS

We thank Boaz Ilan at the School of Natural Sciences, University of California, Merced, 5200 North Lake Road, Merced, CA 95343 for input and discussion.