Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information for

A novel model for pyro-electro-catalytic hydrogen production in pure water

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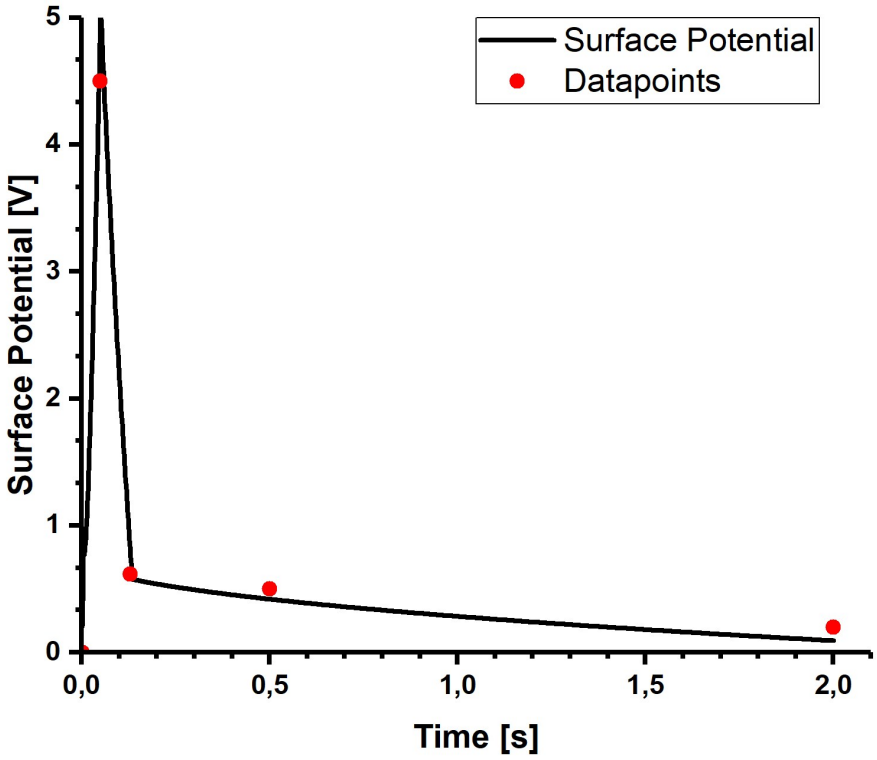

Figure S1: Correlation between the pyro-electro-catalytic model and the measurements of Starr *et al.* The data points were read out from a fig, 3a in Starr et al.[1]

Fig. S1 shows the determination of the kinetic parameters for the different regimes. Varying the parameters in a reasonable range and applying to the model, led to a good congruence of calculation and experimental data. The kinetic parameters were as follows:

Kinetic Parameter	This work (protons, organics, silicates, salt ions)	Starr et al.[2] (every species)
f_{cap}	(0.015, 0.015, 0.015, 0.015)	0.07
f_{sel}	(1, 0.015, 0.015, 0.015)	-
f_{non}	(1, 1, 1, 1)	0.715

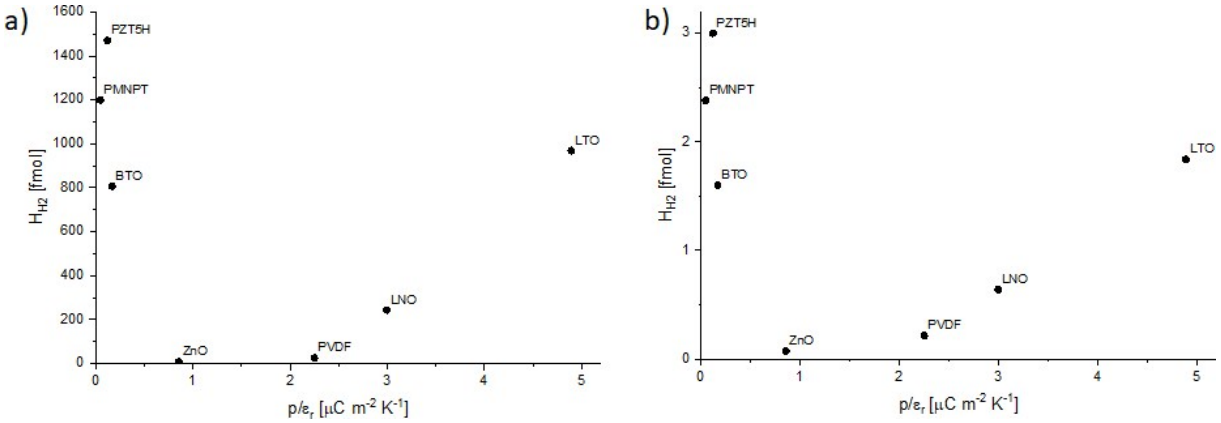

Figure S2: Hydrogen production for different materials and one excitation event. (a) Temperature gradient is 1 K/s and temperature difference is 20 s. (b) Temperature difference is 2 K and temperature gradient is 0.1 K/s.

References

1. M. B. Starr, J. Shi and X. Wang, *Angew. Chem.*, 2012, **124**, 6064-6068.
2. M. B. Starr and X. D. Wang, *Scientific Reports*, 2013, **3**, 8.