Electronic Supplementary Information

to

Tailoring the diameter of electrospun layered perovskite nanofibers for photocatalytic water splitting

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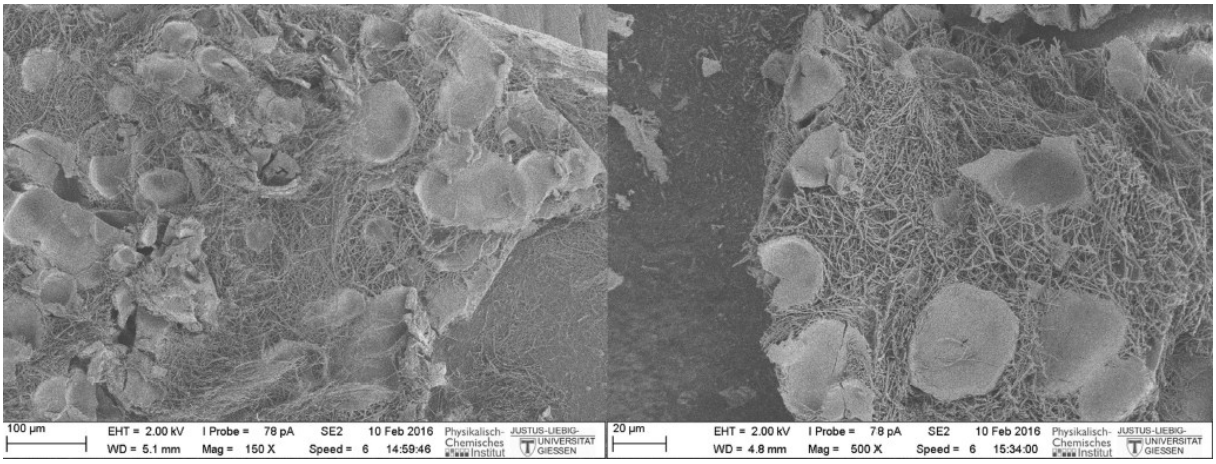

Fig. S1 SEM pictures of the polymer- (left) and calcined (right) fibers obtained with a collector distance of 5 cm and a needle tip potential of 12 kV. Isolated fibers were often not formed at these conditions.

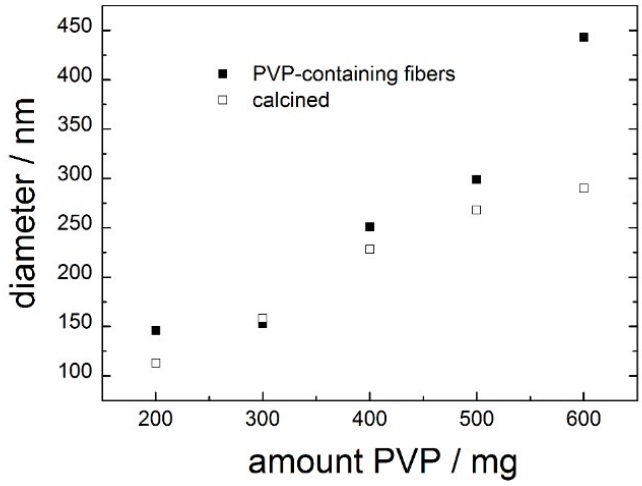

Fig. S2 Diameter of calcined $Ba_5Ta_4O_{15}$ fibers before and after calcination

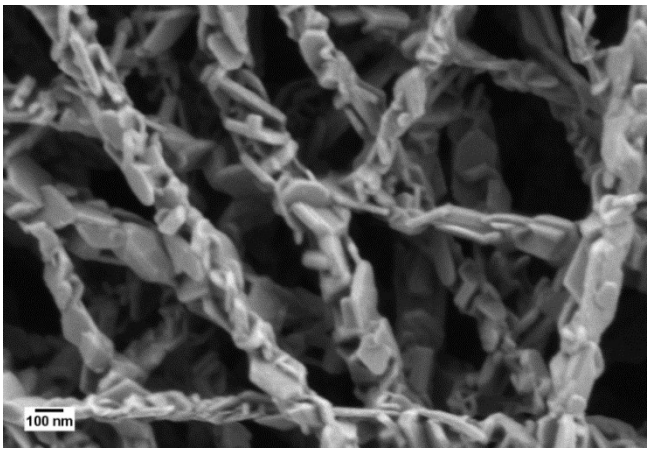

Fig. S3 SEM image of $Ba_5Ta_4O_{15}$ fibers at high magnification after calcination.

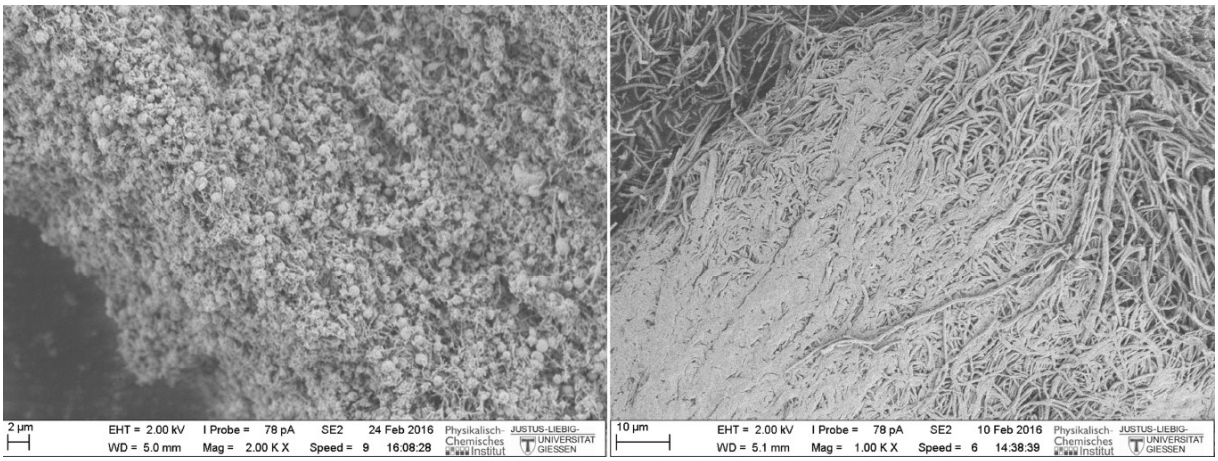

Fig. S4 Further decrease and increase of polymer content led to bead formation (left) or prevented the formation of isolated fibers (right), respectively

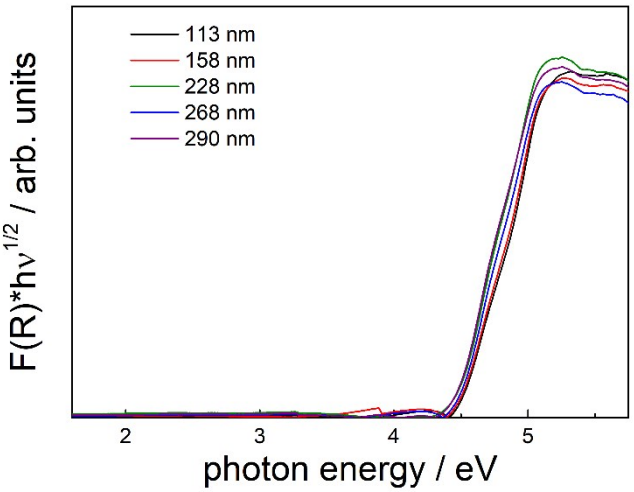

Fig. S5 Tauc plots for all five $Ba_5Ta_4O_{15}$ fiber samples indicating the same band gap and no quantum size effect.

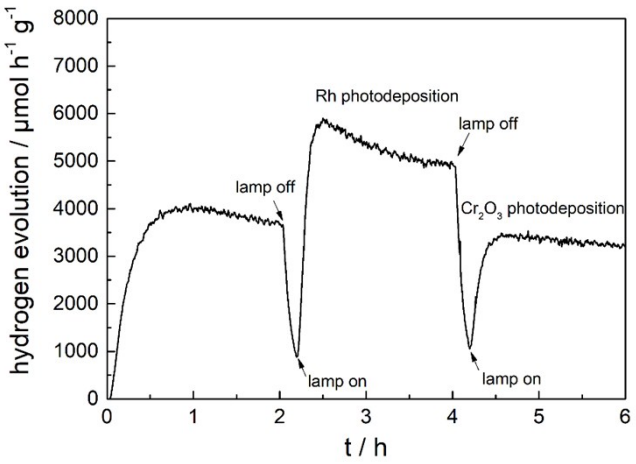

Fig. S6 Time-dependent hydrogen evolution rates during co-catalyst photodeposition, exemplarily shown for $Ba_5Ta_4O_{15}$ fibers with 290 nm diameter.

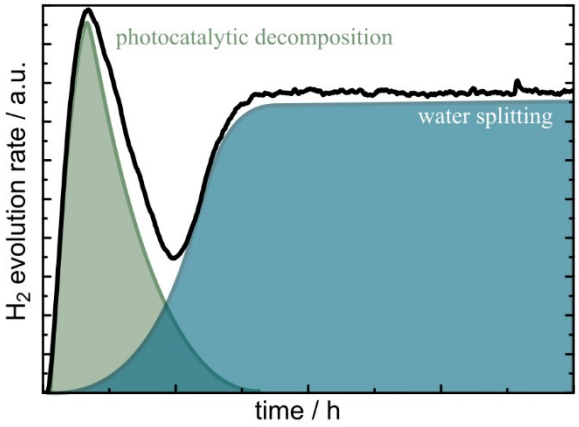

Fig. S7. Explanation for the hydrogen evolution rate during water splitting experiments, exemplarily shown for fibers with 158 nm diameter.

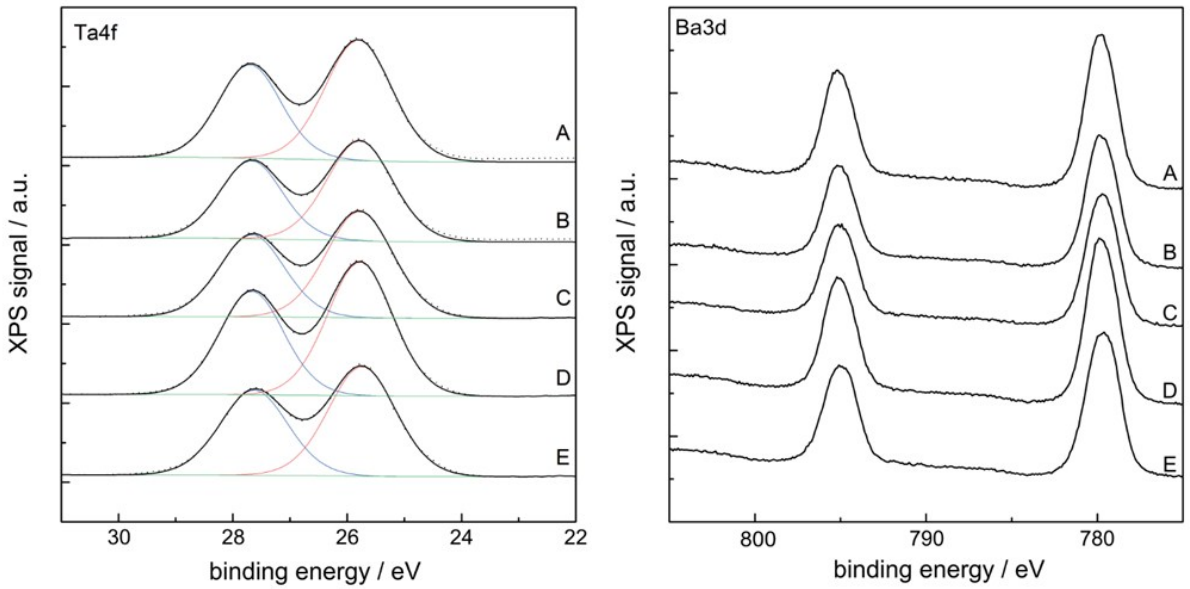

Fig. S8. Detailed XP spectra of Ta4f and Ba 3d regions for $Ba_5Ta_4O_{15}$ fibers with 290 nm (A), 268 nm (B), 228 nm (C), 158 nm (D) and 113 nm diameter.

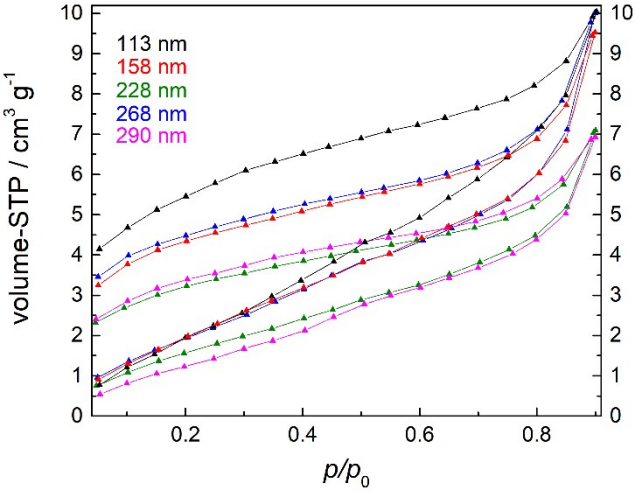

Fig. S9 Water soprtion data of $Ba_5Ta_4O_{15}$ fibers with different diameters.

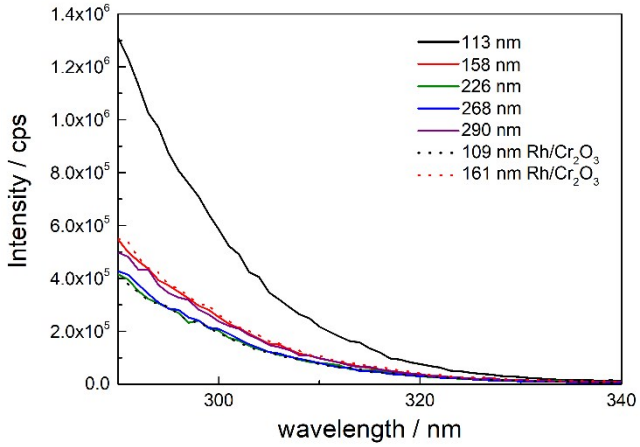

Fig. S10: Photoluminescence of solid $Ba_5Ta_4O_{15}$ fibers with different diameters