Supporting Information

Controllable Ag Migration to Form One-dimensional Ag/Ag$_2$S@ZnS for Bifunctional Catalysis

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Figure S1. FESEM images (a, c) and EDX patterns (b, d) of the Ag NWs (a, b) and Ag@m-SiO$_2$ (c, d).
Figure S2. XRD patterns of the 1D Ag/Ag$_2$S@ZnS-I, II, and III.

Figure S3. FESEM image (a), TEM image (b), HRTEM image (c), TEM bright field images (d) and elemental mappings (e-g) of the sample Ag/Ag$_2$S@ZnS-II.
Figure S4. XPS results (S 2p and Zn 2p) of Ag/Ag₂S@ZnS-I (a, d), Ag/Ag₂S@ZnS-II (b, e) and Ag/Ag₂S@ZnS-III (c, f), respectively.

Figure S5. The MNN Auger signals for the Ag/Ag₂S@ZnS samples.
Figure S6. LSV curves (a, d), Tafel plots (b, e) and stability performances (c, f) (under blue light) of the Ag/Ag₂S@ZnS-II (a-c) and III (d-f), respectively.

Figure S7. LSV curves (a) and Tafel plots (b) collected with and without light irradiation of the control samples (Ag/Ag₂S and pure ZnS).
Figure S8. SEM (a and c) and TEM (b and d) images of the sample Ag/Ag$_2$S-I (a and b) after HER stability measurement for 12 h and the sample Ag/Ag$_2$S-III (c and d) after photocatalytic test for H$_2$ evolution.