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# Solar-driven water evaporation using a collaborative photothermal conversion material system based on carbonized waste polyphenylene sulfide and copper sulfide

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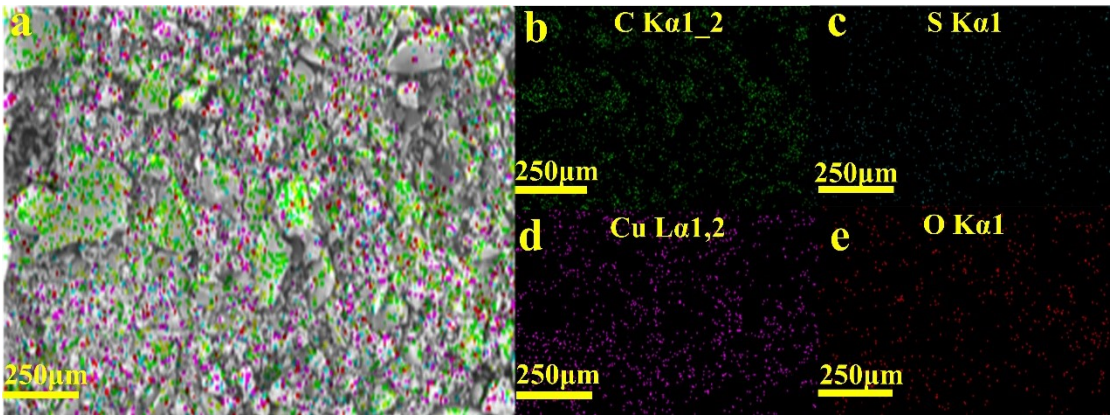
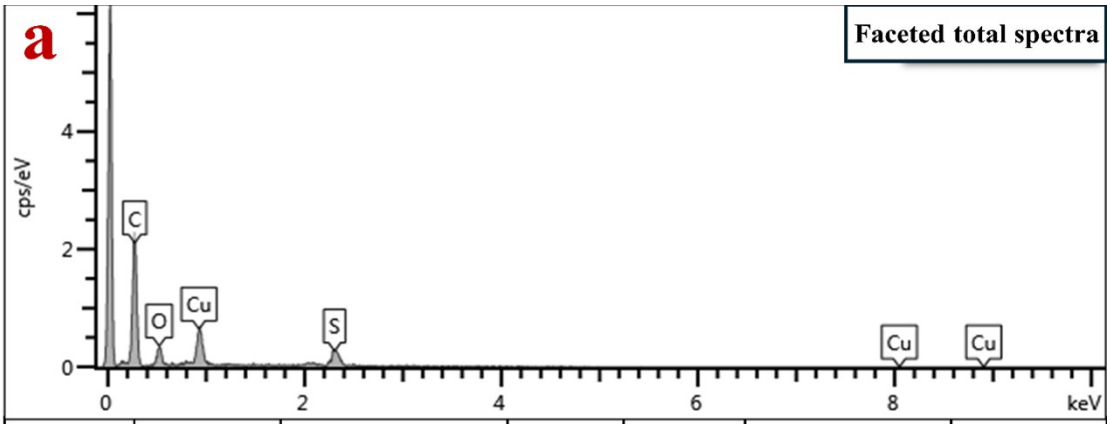



**Fig S1.** EDS image of upper surface of the CP/CUS mixture.




b

| Element | Line type | Apparent concentrations | k ratio | wt% | wt% Sigma | Standard sample labels |
|---|---|---|---|---|---|---|
| C | K-line system | 51.02 | 0.51016 | 53.58 | 1.17 | Pure Element |
| O | K-line system | 8.27 | 0.07243 | 6.18 | 0.47 | SiO2 |
| S | K-line system | 35.52 | 0.37688 | 21.88 | 1.17 | FeS2 |
| Cu | L-line system | 24.92 | 0.24920 | 18.37 | 0.86 | Pure Element |
| Total.: | | | | 100.00 | | |

**Fig S2. Faceted total spectra of CP/CuS mixtures and distribution information of the corresponding elements.**

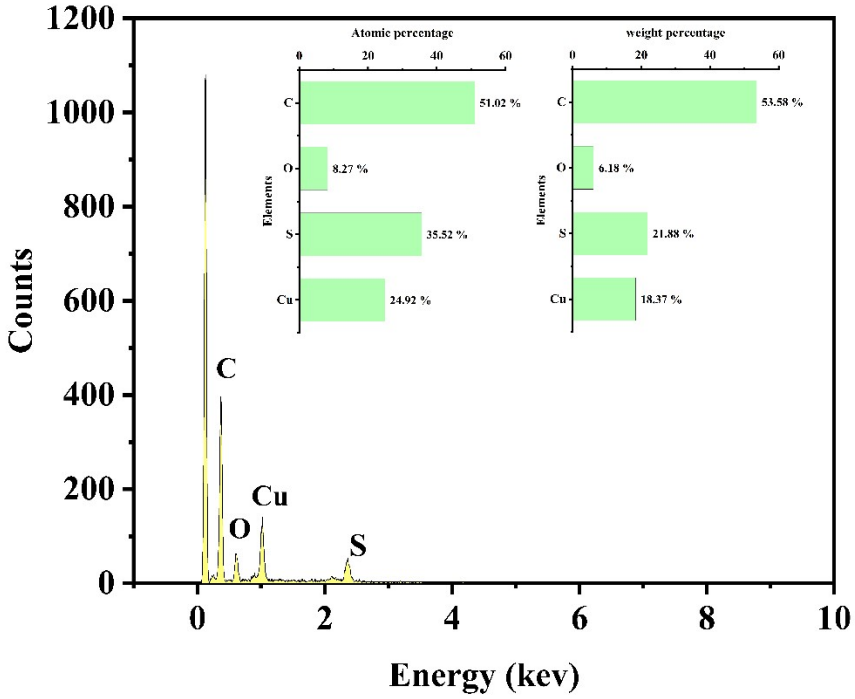



**Fig S3. Generalised map of the faceted total spectra of CP/CuS mixtures and information on the distribution of the corresponding elements.**

| Material | Water Evaporation rate (kg m-2 h-1) | Efficiency at 1 sun (%) | Absorption (%) | Ref. |
|---|---|---|---|---|
| Wood/CNTs | ~0.98 | 65 | ~98 | [37] |
| Wood/Graphite | 1.2 | 80 | >95 | [38] |
| Graphene oxide/MX | 1.27 | 90.7 | _ | [23] |
| GO film | 1.45 | 80 | >94 | [32] |
| Graphene/carbon | 1.558 | 90 | 97.57 | [31] |
| Graphene sponge /Graphene foil | 1.69 | 89.6 | ~97.4 | [30] |
| Polypyrrole coated natural latex foam | 1.76 | 98 | 94.94 | [25] |
| Cobalt-based MOF | 2.2 | 91.1 | 97-98 | [47] |
| MnO2- modified cotton cloth | 2.67 | 89.5 | 85 | [35] |
| CP/CuS-Wood | 2.68 | 93.2 | 98.23 | This work |
| Porous carbon polyhedron | 2.74 | 98.2 | 99 | [40] |

**Table S1. Comparison of the CP/CuS-Wood optical hot water evaporator with the literature**

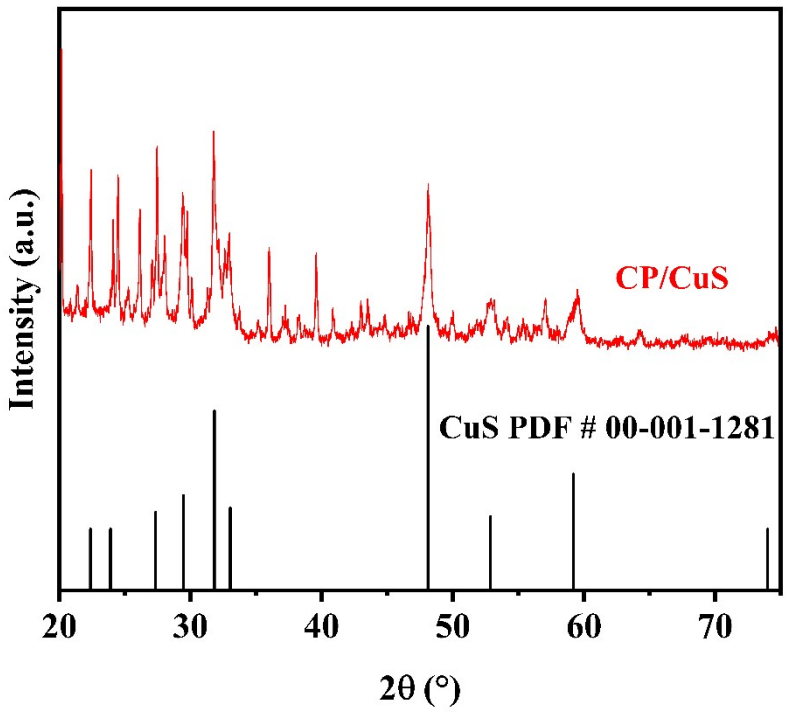



**Fig S4. XRD spectrum of photothermal material CP/CuS.**

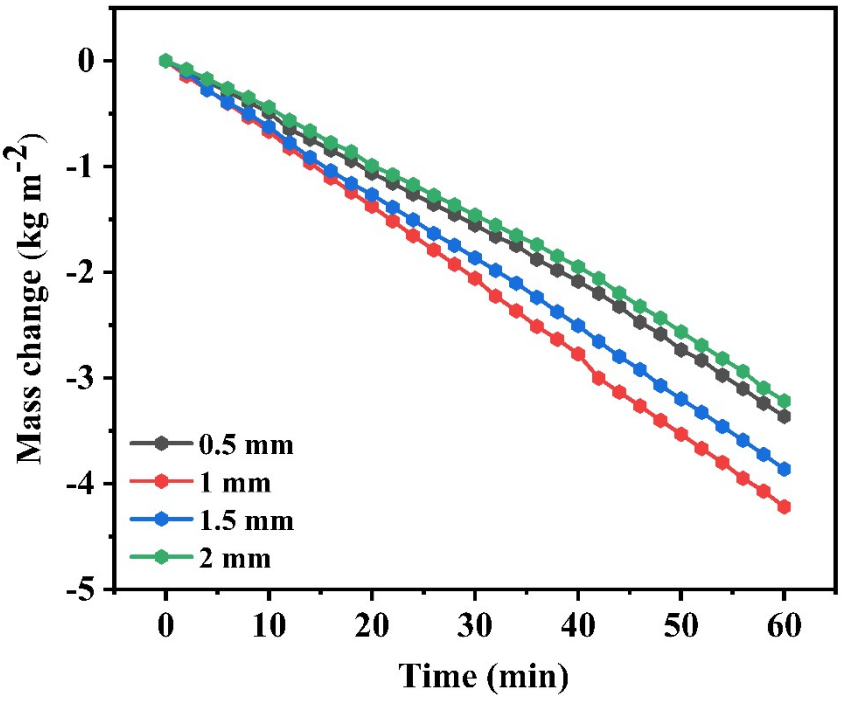



**Fig S5. The mass loss in a hot water evaporator is dependent on the thickness of the CP/CuS photosensitive material.**