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## Supporting Information

### 2 Multiscale Synergetic Bandgap/Structure Engineering to Construct

### 3 Full-Spectrum Responsive Heterostructured MoS<sub>2</sub>/SnS<sub>2</sub> Photocatalysts

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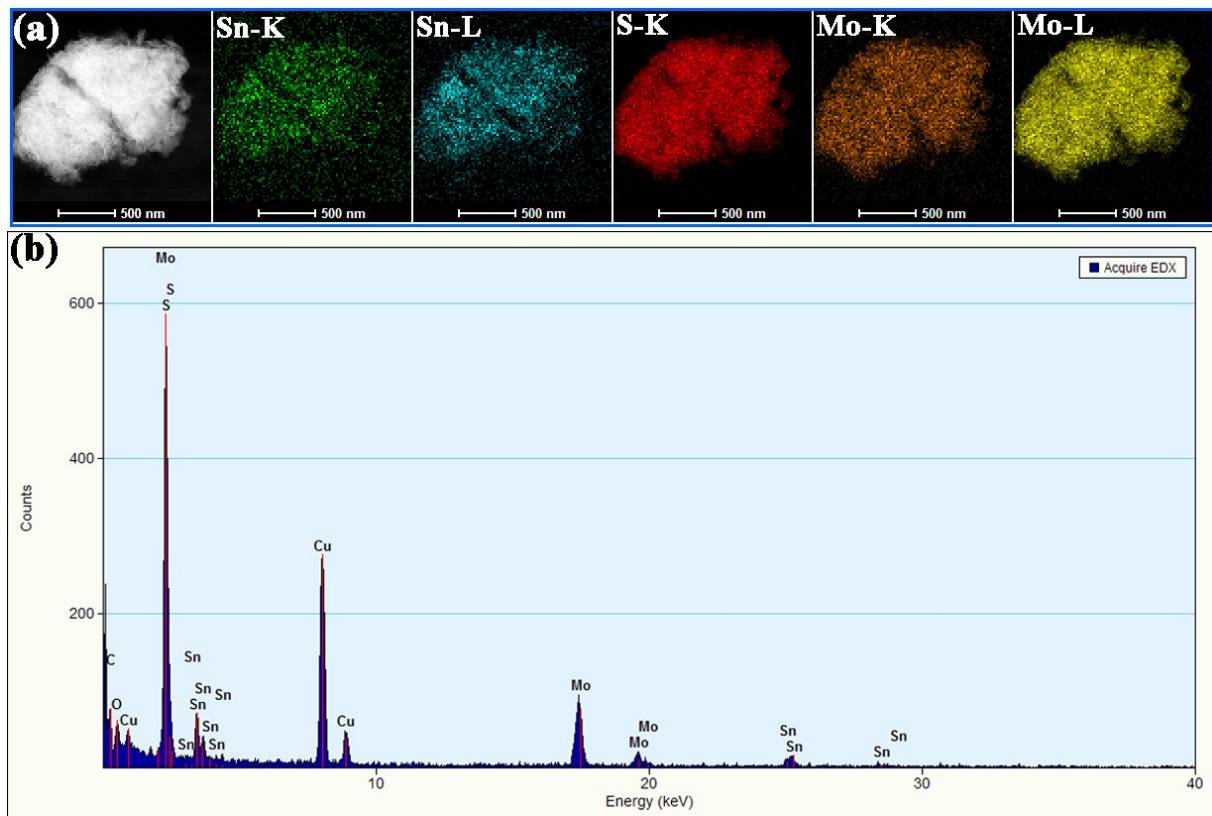
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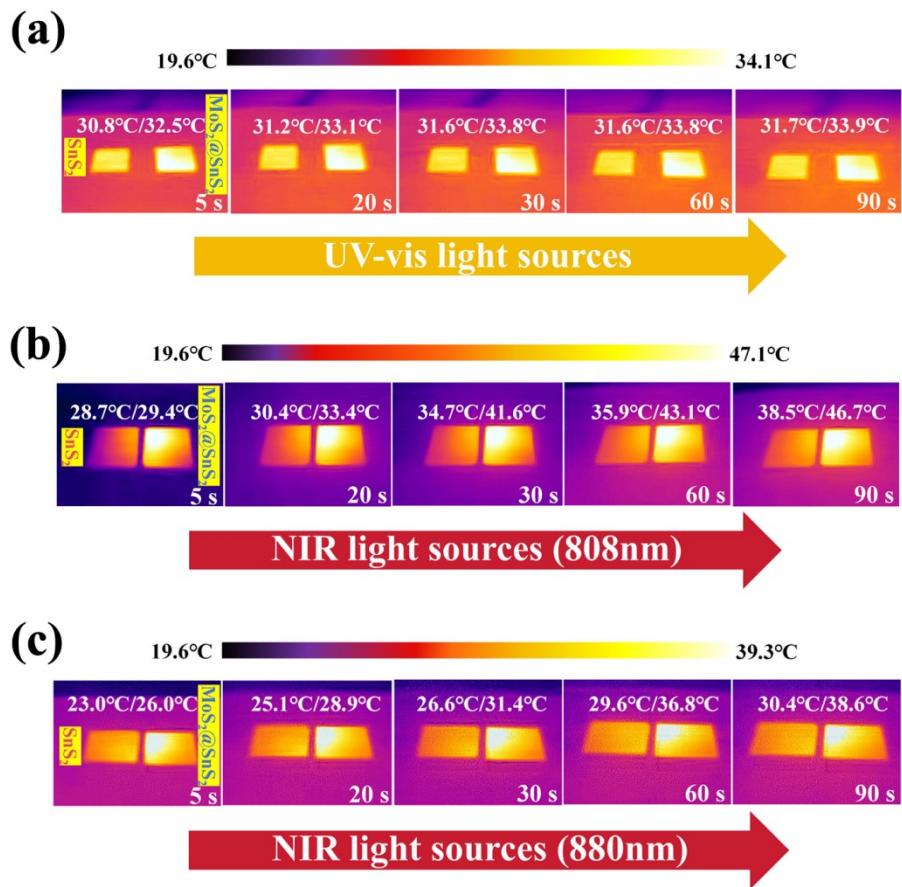
### ■ RESULTS AND DISCUSSION



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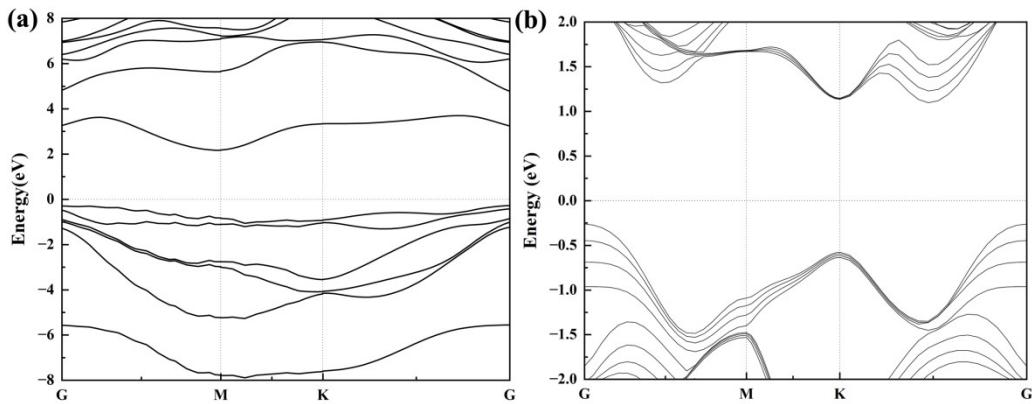
**Fig- S1.** (a) EDX elemental mapping and (b) EDX spectrum of  $\text{MoS}_2/\text{SnS}_2$  heterostructure.



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33 **Figure S2.** The time-dependent temperature and thermal image for SnS<sub>2</sub> and MoS<sub>2</sub>/SnS<sub>2</sub> under UV-vis  
34 light and NIR light (808 and 880 nm) irradiation.

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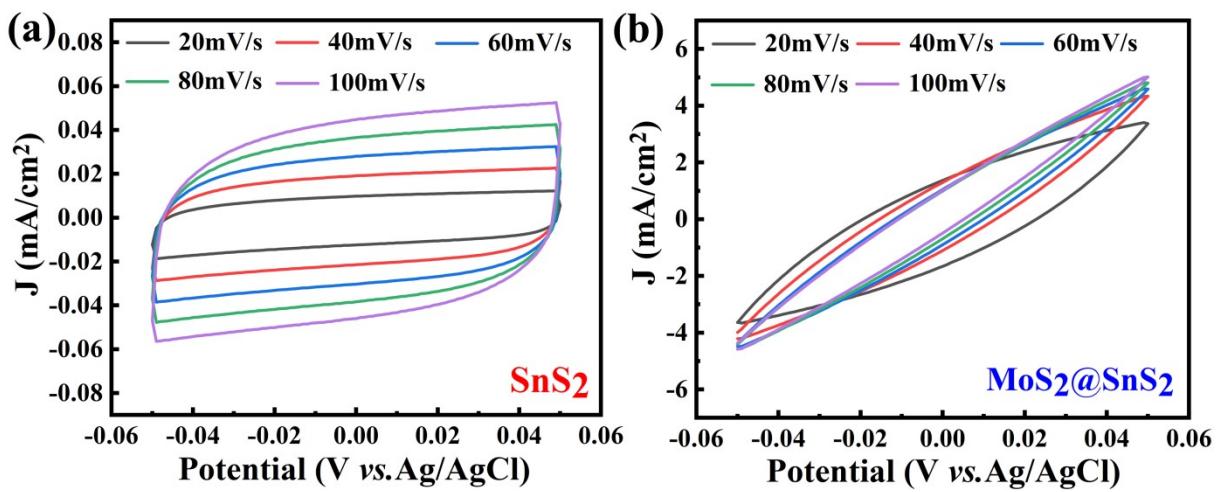
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38 **Figure S3.** (a) Band structure of the original SnS<sub>2</sub> monolayer. (b) Band structure of the original MoS<sub>2</sub>  
39 multilayer.

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44 **Fig- S4.** Cyclic voltammetry (CV) of at various scan rates for (a) SnS<sub>2</sub> and (b) MoS<sub>2</sub>/SnS<sub>2</sub>.

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46 **Table S1.** The simulated parameter values obtained by fitting the Nyquist plots.

Samples	SnS <sub>2</sub>	MoS <sub>2</sub> @SnS <sub>2</sub>
R <sub>s</sub> (ohm)	7.94	8.94
R <sub>ct</sub> (ohm)	566.8	3.56
CPE1(mF)	912.71	685.86

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