

**Supporting Information**  
**Rational design of hierarchical structural**  
**CoSe@NPC/CoSe@CNTs nanocomposites derived from**  
**metal-organic-frameworks as a robust Pt-free**  
**electrocatalyst for dye-sensitized solar cells**

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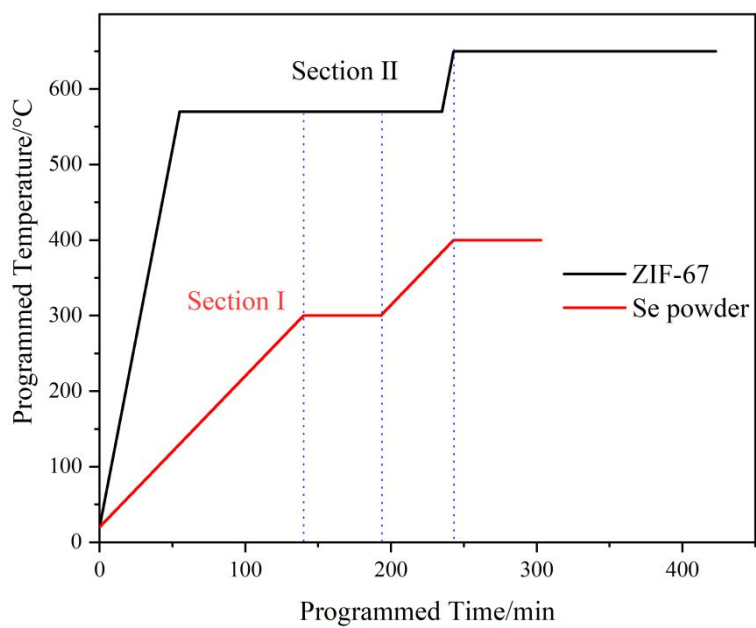
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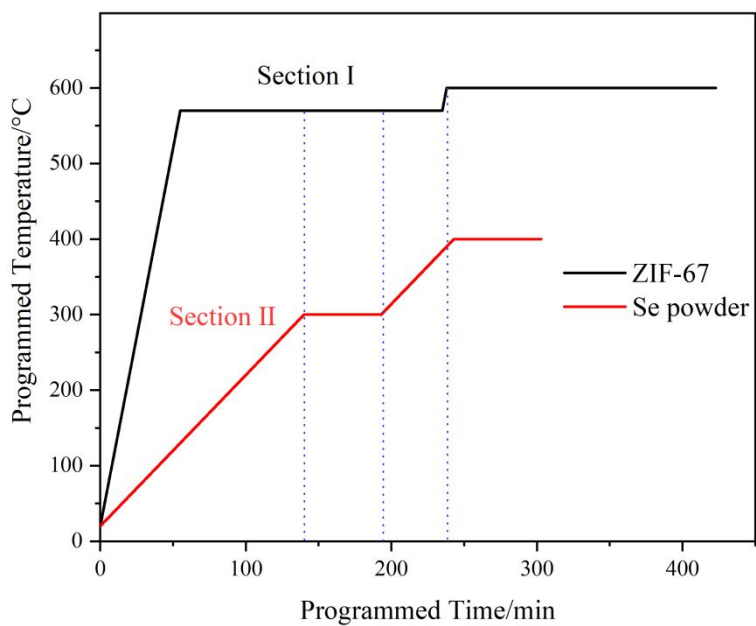
<sup>1</sup> Tong Wang and Yongjian Li contributed equally to this work.

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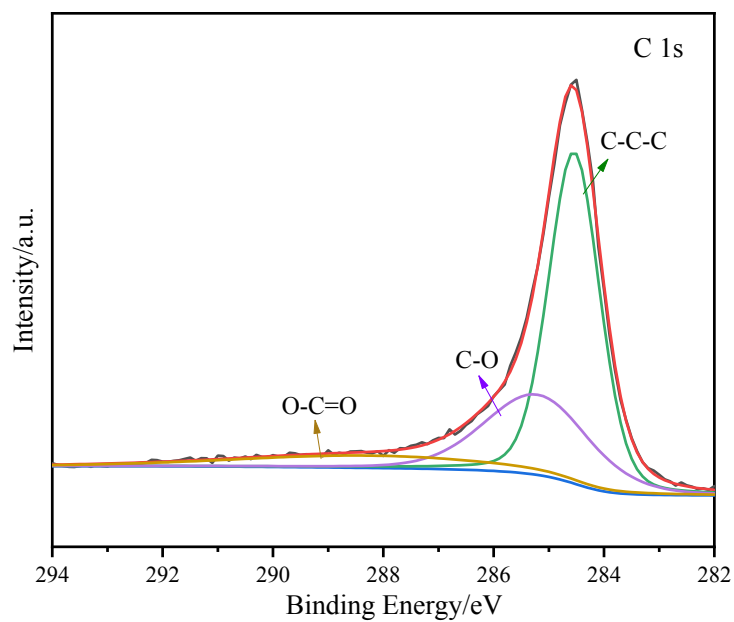
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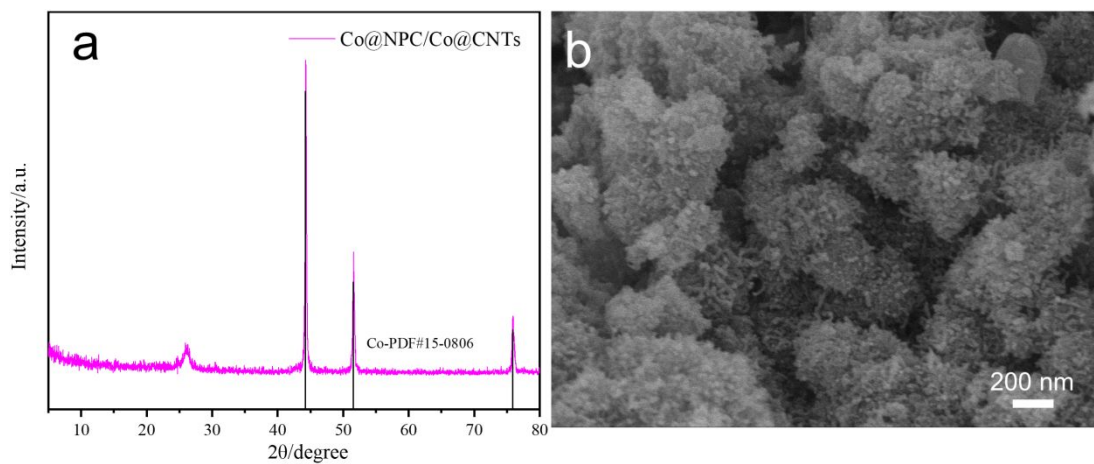
**Figure S1** The heating program of MSTPE to prepare CoSe@NPC/CoSe@CNTs



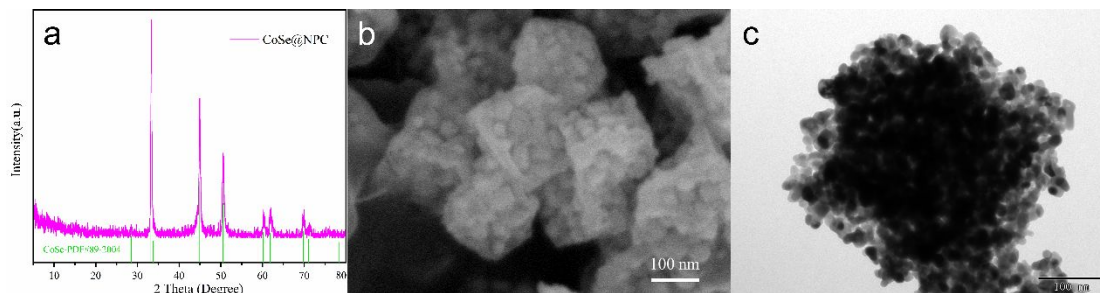
**Figure S2** The control heating program of MSTPE



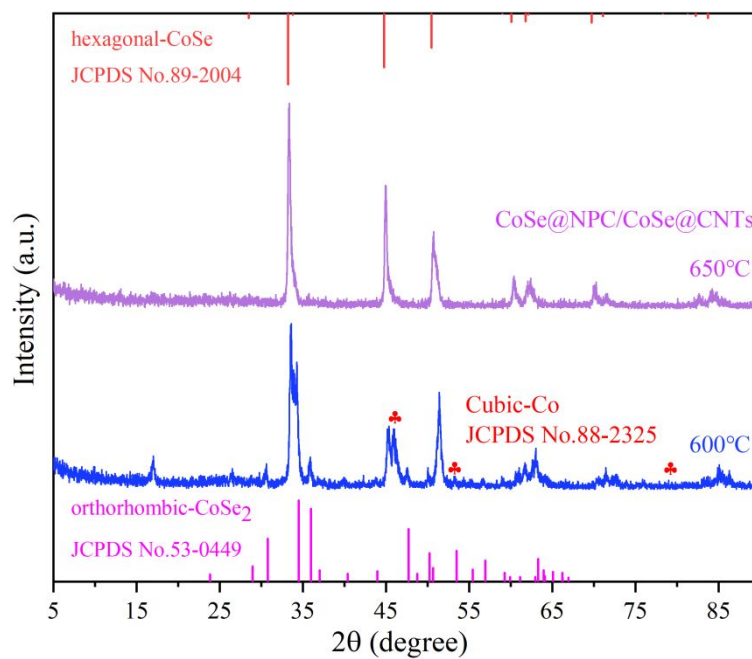
**Figure S3** High-resolution XPS survey spectra of C 1s CoSe@NPC/CoSe@CNTs sample.



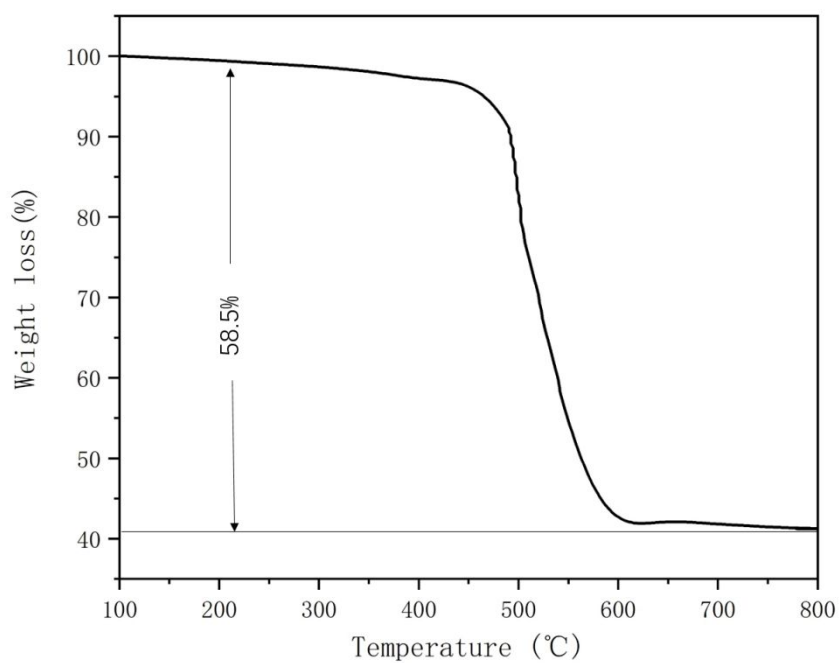
**Figure S4** (a)XRD pattern and (b)SEM image of the intermediate product Co@NPC/Co@CNTs



**Figure S5** (a)XRD pattern, (b)SEM image and (c)TEM image of CoSe@NPC



**Figure S6** The XRD pattern of selenization of ZIF-67 with different temperature



**Figure S7** TGA curve of the CoSe@NPC/CoSe@CNTs in air atmosphere.