

Supporting Information

Water-soluble ZnSe/ZnS:Mn/ZnS quantum dots convert UV to visible light for improved Si solar cell efficiency

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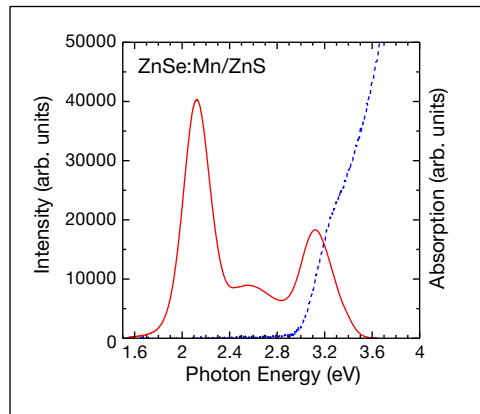


Figure S1. Optical properties of ZnSe:Mn/ZnS core/shell QDs. Absorption (dashed line) and PL spectra (solid line) of ZnSe:Mn/ZnS core/shell QDs.

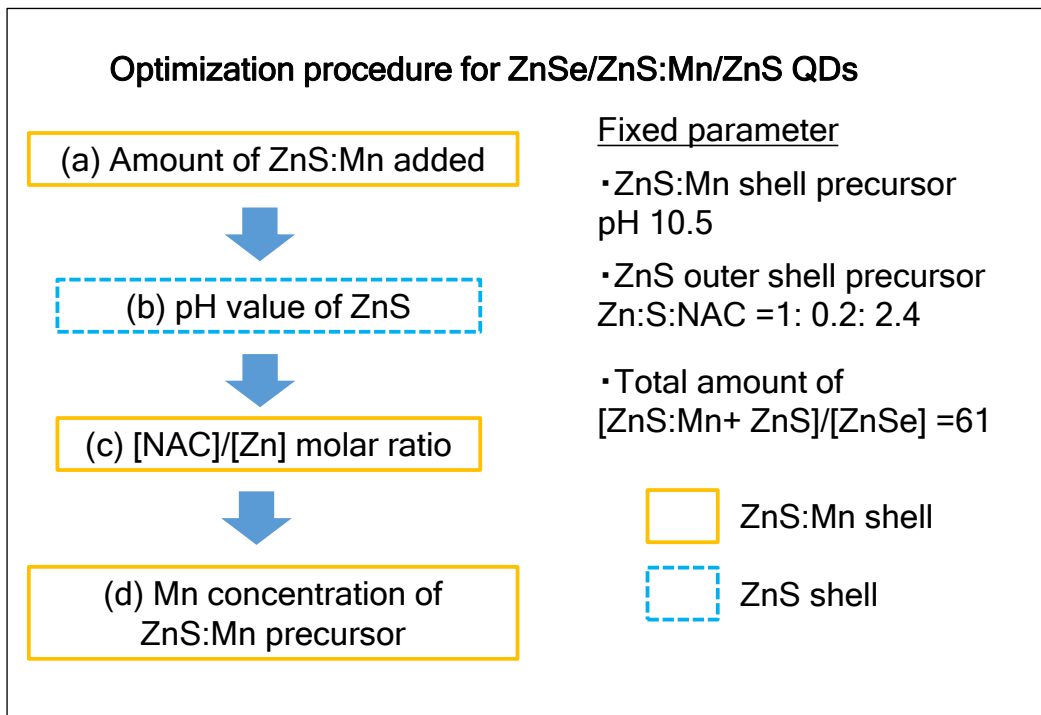


Figure S2. Flowchart for optimising the synthesis of ZnSe/ZnS:Mn/ZnS core/shell/shell QDs.

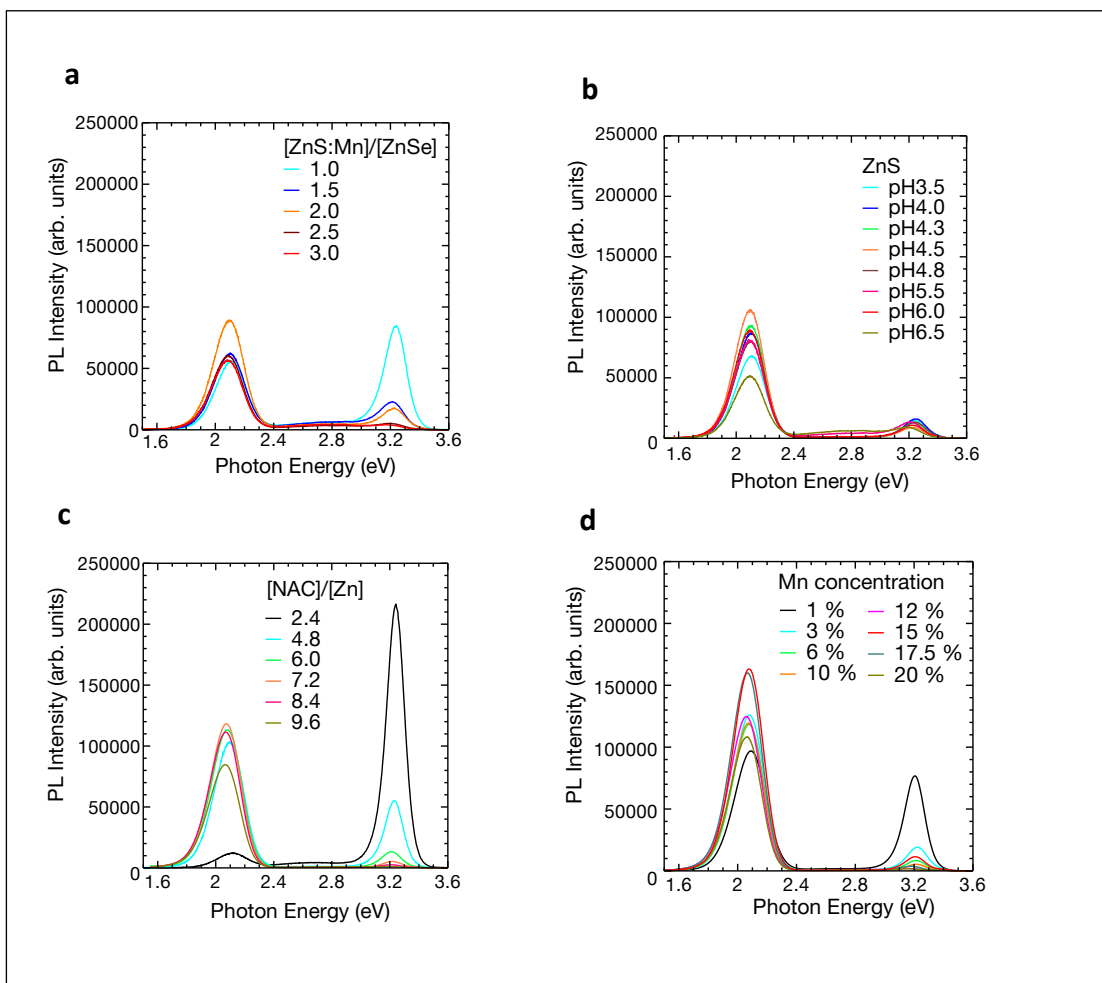


Figure S3. PL spectra of ZnSe/ZnS:Mn/ZnS core/shell/shell QDs prepared under various conditions. (a) Dependence on the [ZnS:Mn]/[ZnSe] ratio. (b) Dependence on the pH of the ZnS precursor. (c) Dependence on the [NAC]/[Zn] molar ratio of the ZnS precursor. (d) Dependence on the Mn concentration of the ZnS:Mn precursor.

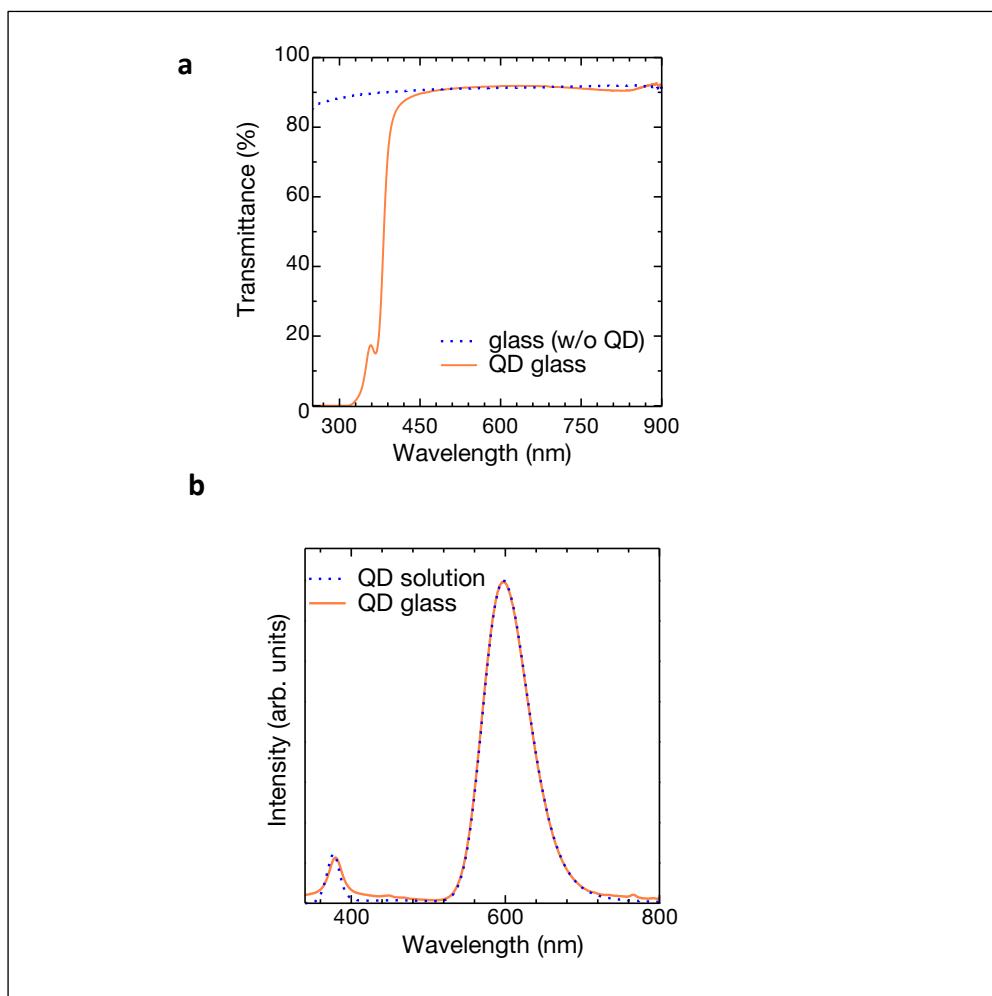


Figure S4. Optical wavelength-conversion glass (QD glass) measurements. (a) Transmittance spectra of sol-gel glass without the ZnSe/ZnS:Mn/ZnS core/shell/shell QD solution (dotted line) and with the QD glass (solid line). (b) PL spectra of the ZnSe/ZnS:Mn/ZnS core/shell/shell QD solution (dotted line) and the QD glass (solid line) (excited at 325 nm).

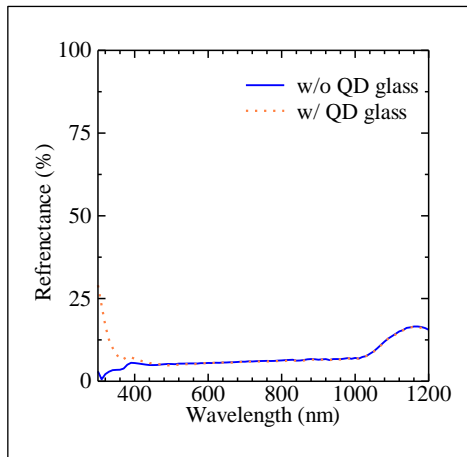


Figure S5. Surface reflectance of Si solar cells with and without the QD glass.

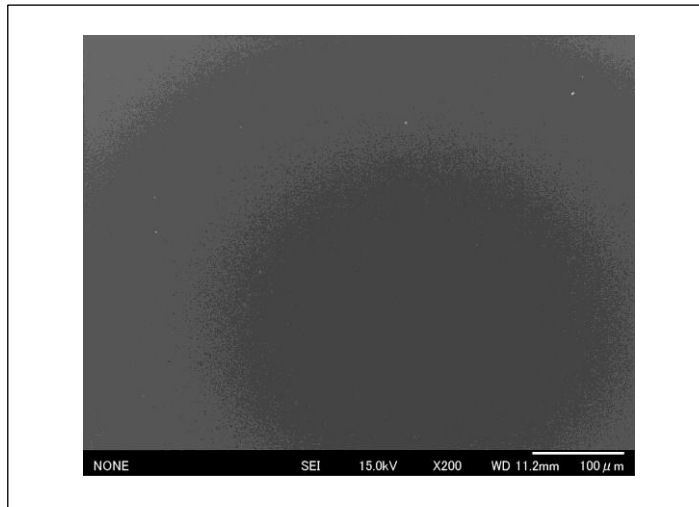


Figure S6. SEM image of the solar cell with the QD glass.