

## Supp. Mater.

# Controllable synthesis of high quality ZnSe, ZnSe/ZnS, and Cu-, Mn- doped ZnSe nanocrystals by phosphine-free method

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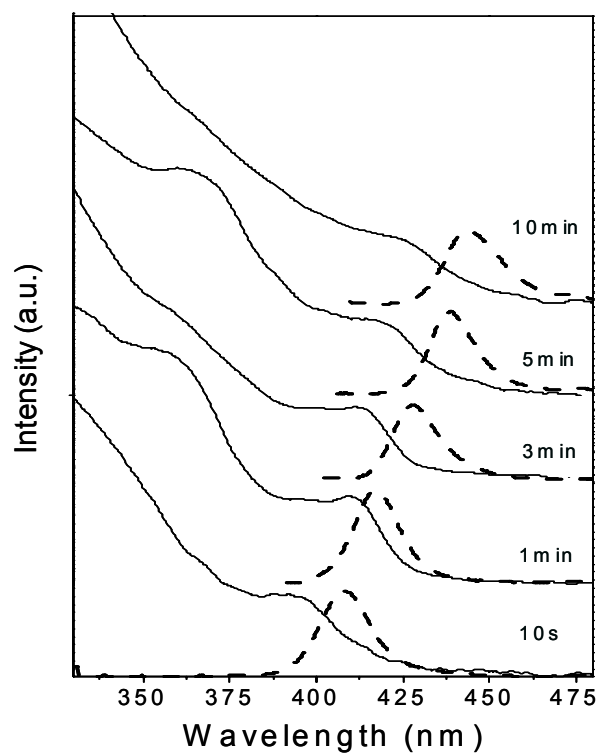


Fig. S1 Absorption and PL spectra of as-prepared ZnSe nanocrystals using selenium precursor injection method.

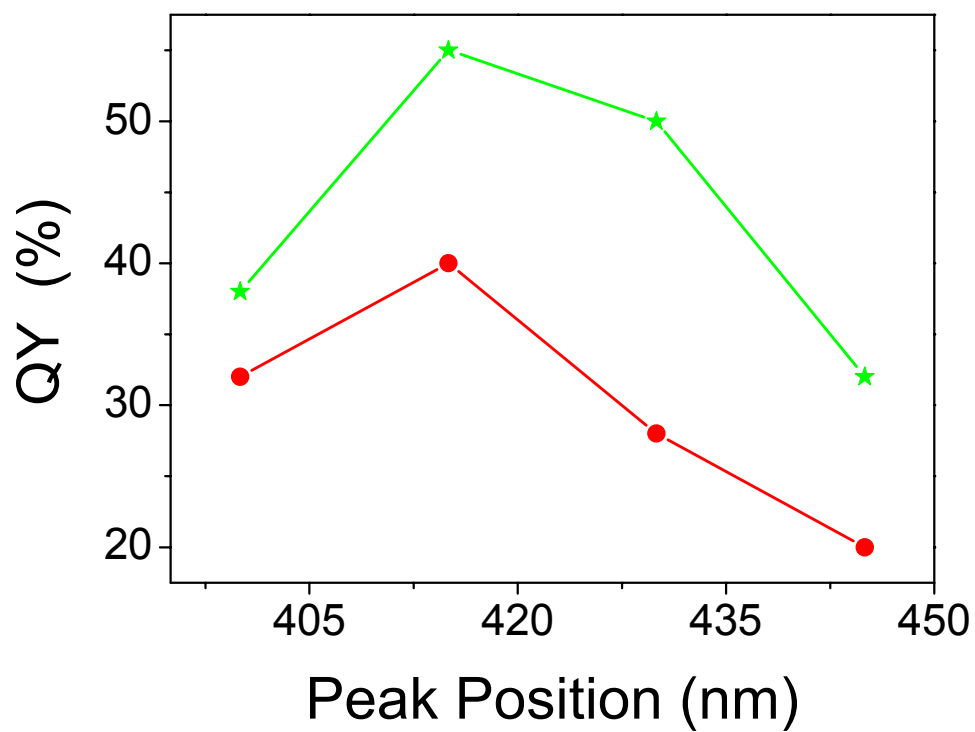


Fig. S2 Quantum yield changes vs peak position of ZnSe nanocrystals synthesized by selenium precursor injection (red) and zinc precursor injection at 310 °C (green).

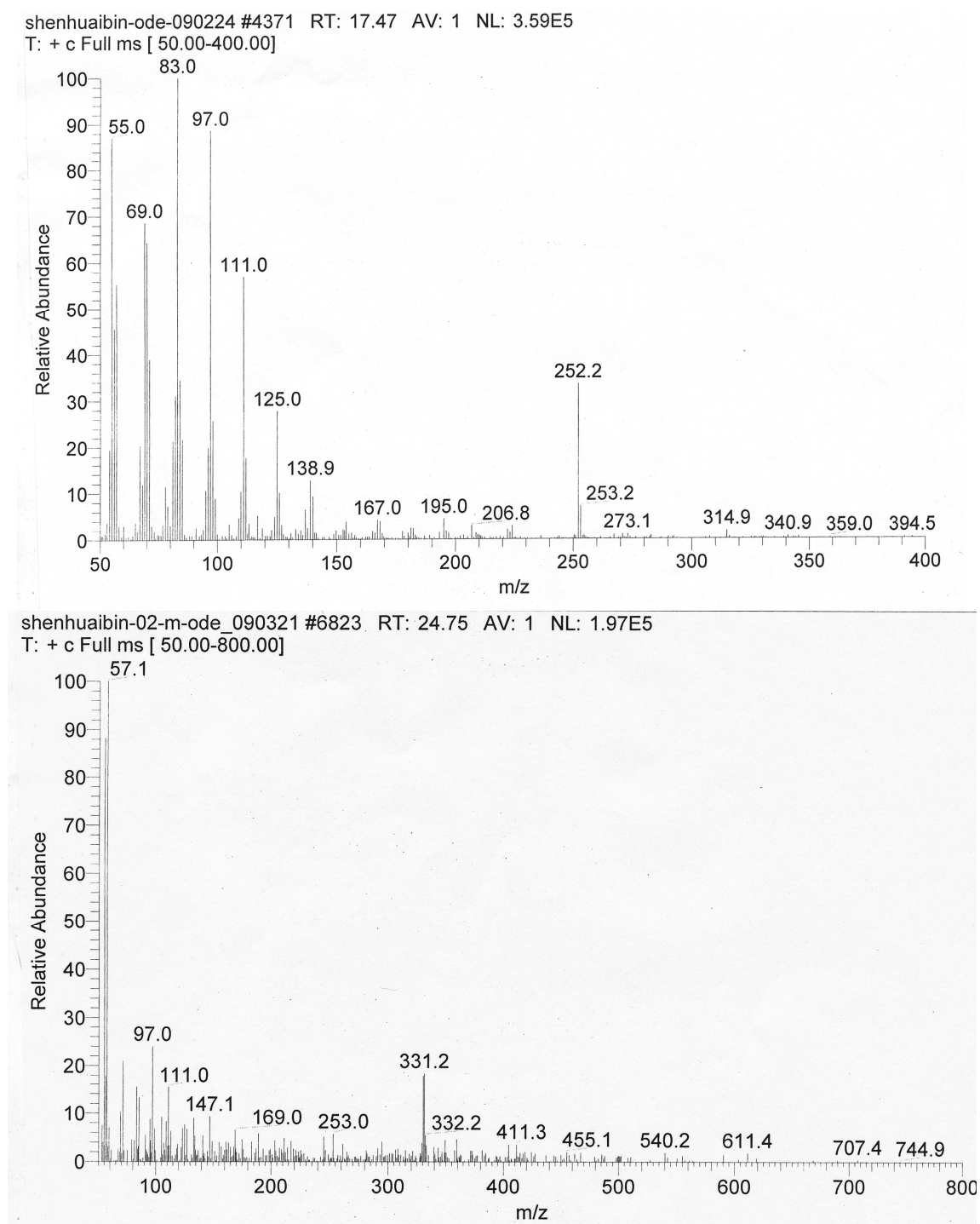


Fig. S3 Mass spectrum of pure ODE (top) and 0.2 M Se-ODE (bottom). The peak related to ODE ( $m/z$  252.2) was weaker in Se-ODE and shown a new peak at  $m/z$  331.2 corresponding to the combination between Se and ODE.

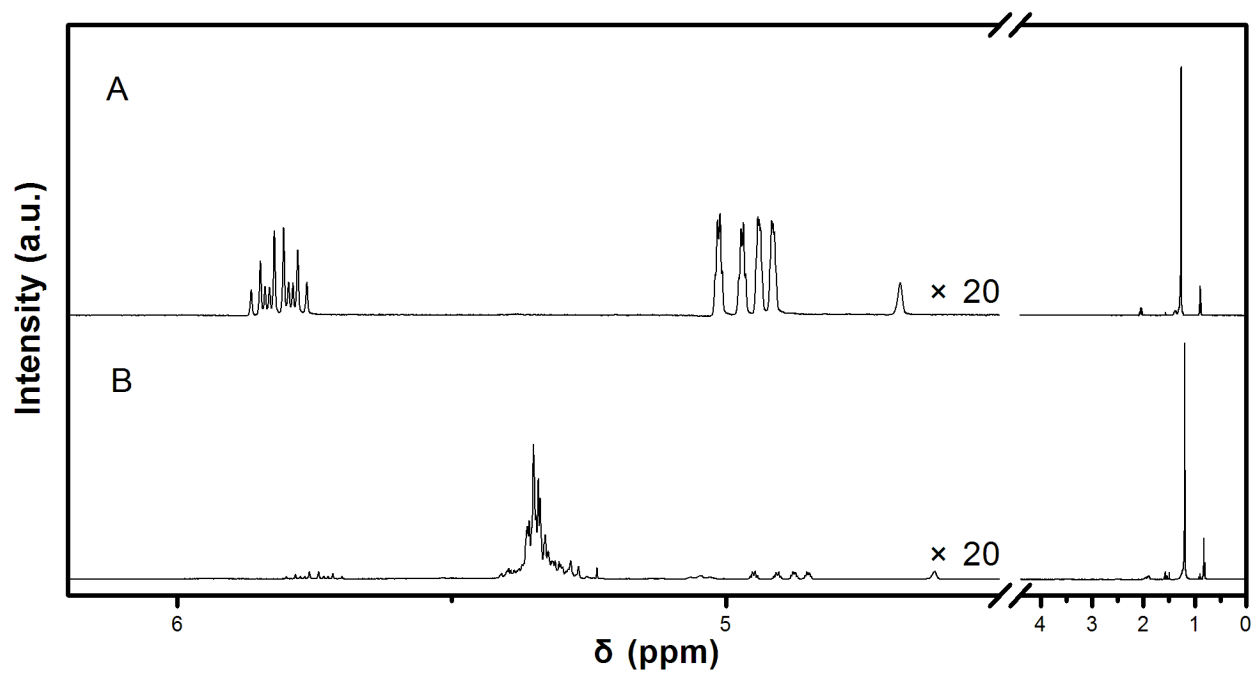


Fig. S4 <sup>1</sup>H NMR spectra of (A) ODE and (B) 0.2 M Se-ODE.

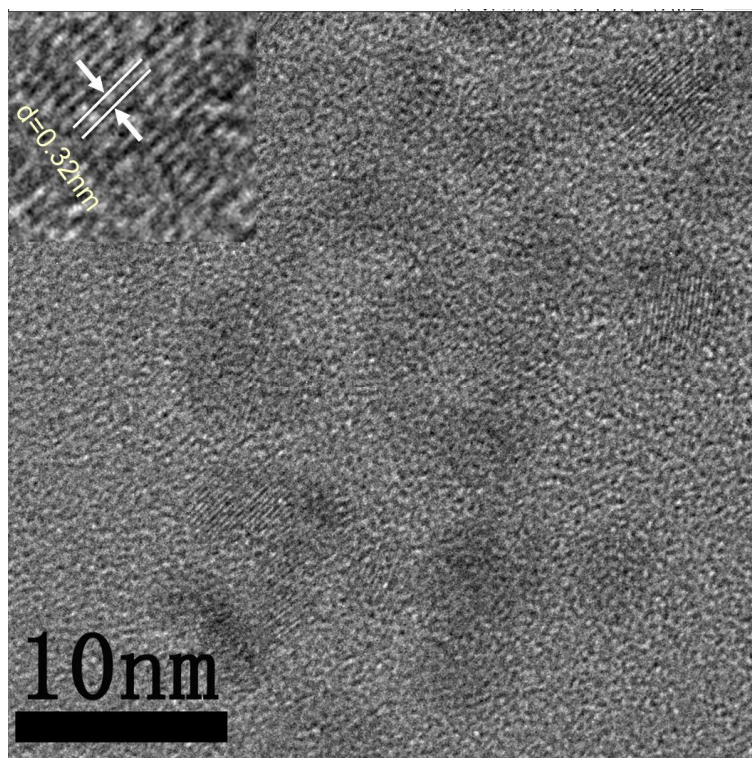


Fig. S5 HRTEM images of ZnSe nanocrystals (diameter  $\sim 5.0$  nm).

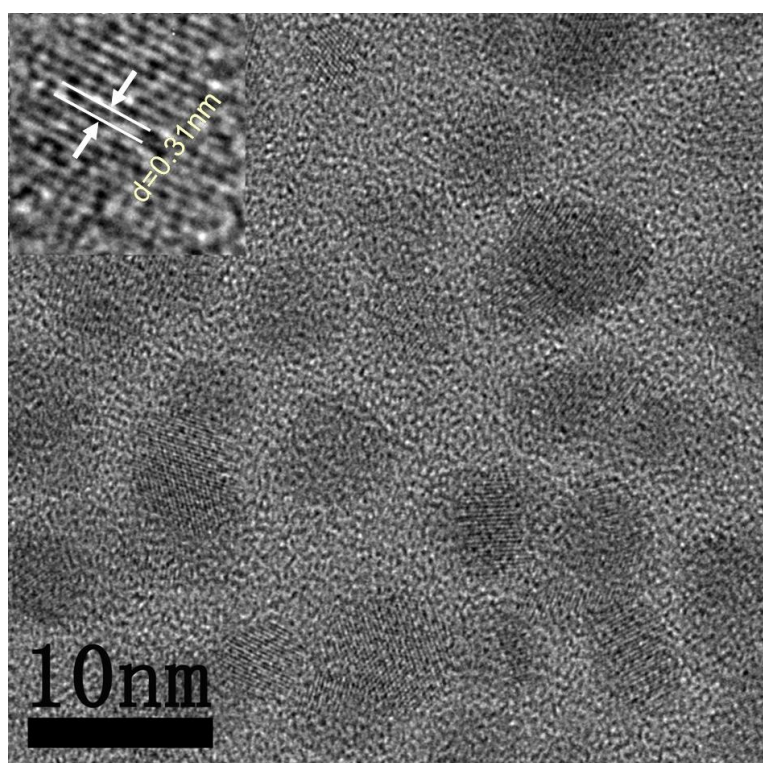


Fig. S6 HRTEM images of ZnSe/ZnS nanocrystals (diameter  $\sim 6.5$  nm).



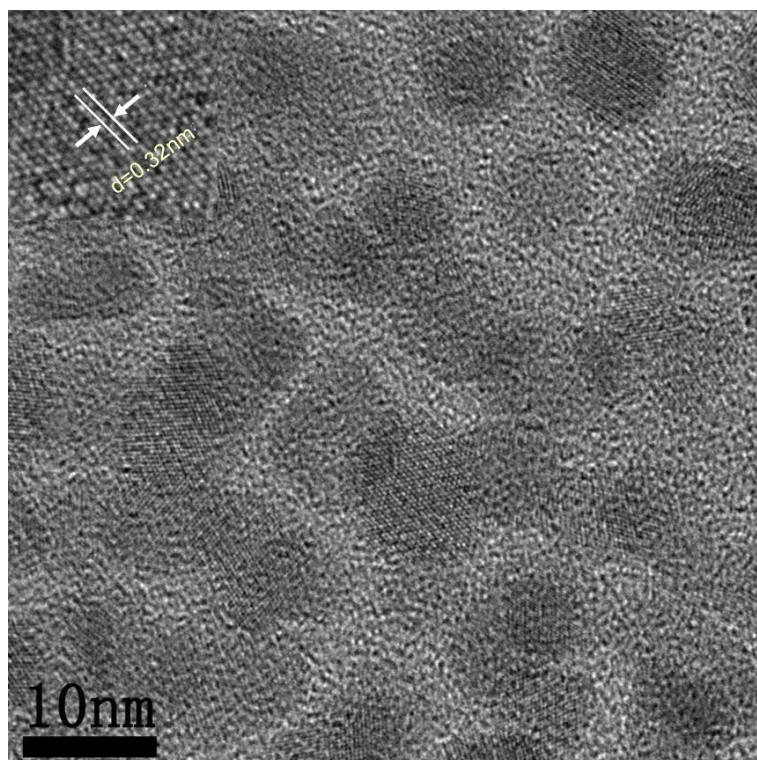


Fig. S7 HRTEM images of Cu doped ZnSe nanocrystals (diameter  $\sim 9.2$  nm).

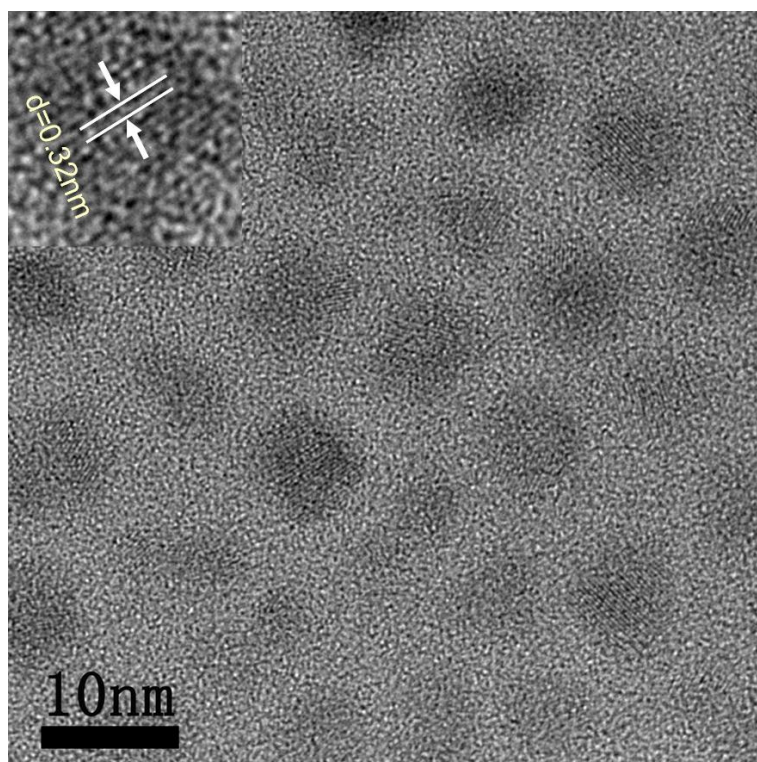


Fig. S8 HRTEM images of Mn doped ZnSe nanocrystals.