

## Supporting Information

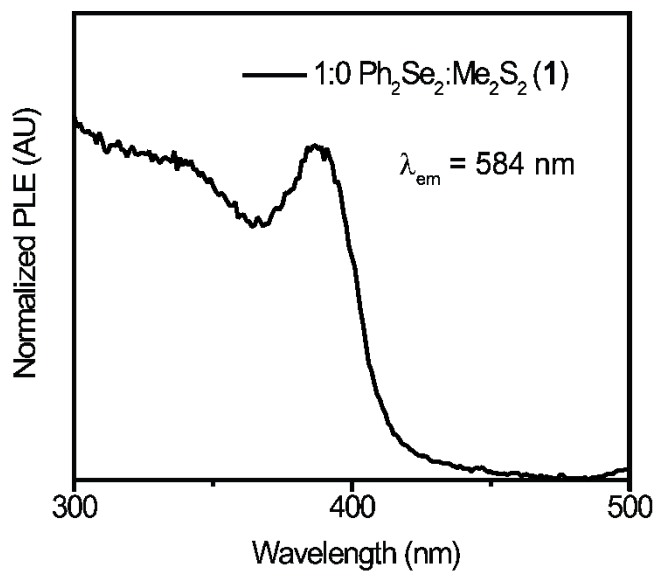
### Single-step synthesis of hyperbranched, luminescent Mn<sup>2+</sup>-doped ZnSe<sub>1-x</sub> S<sub>x</sub> nanocrystals using dichalcogenide precursors

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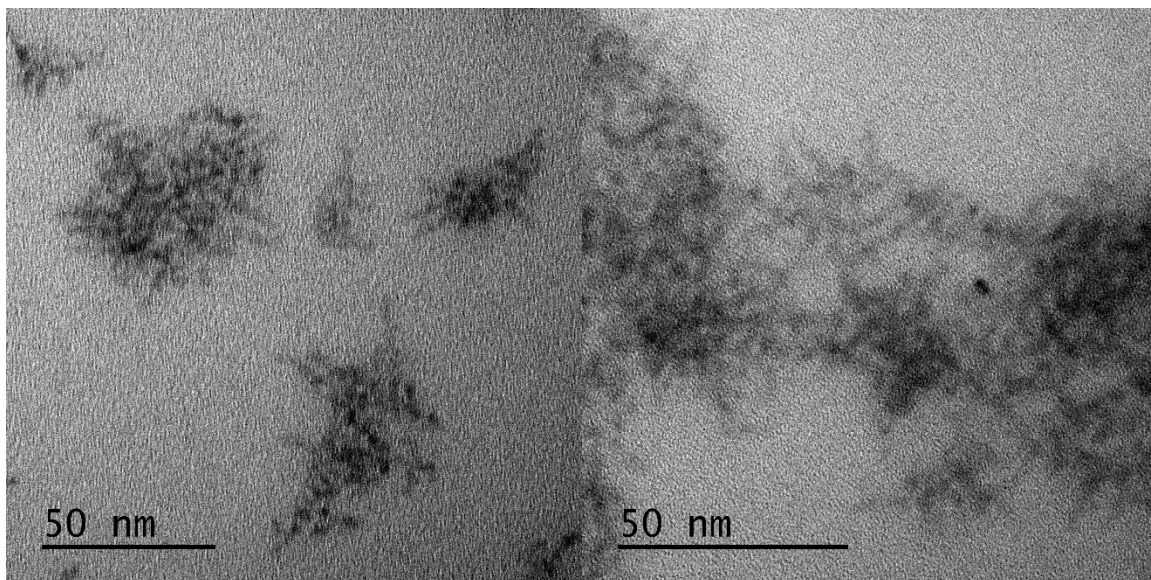
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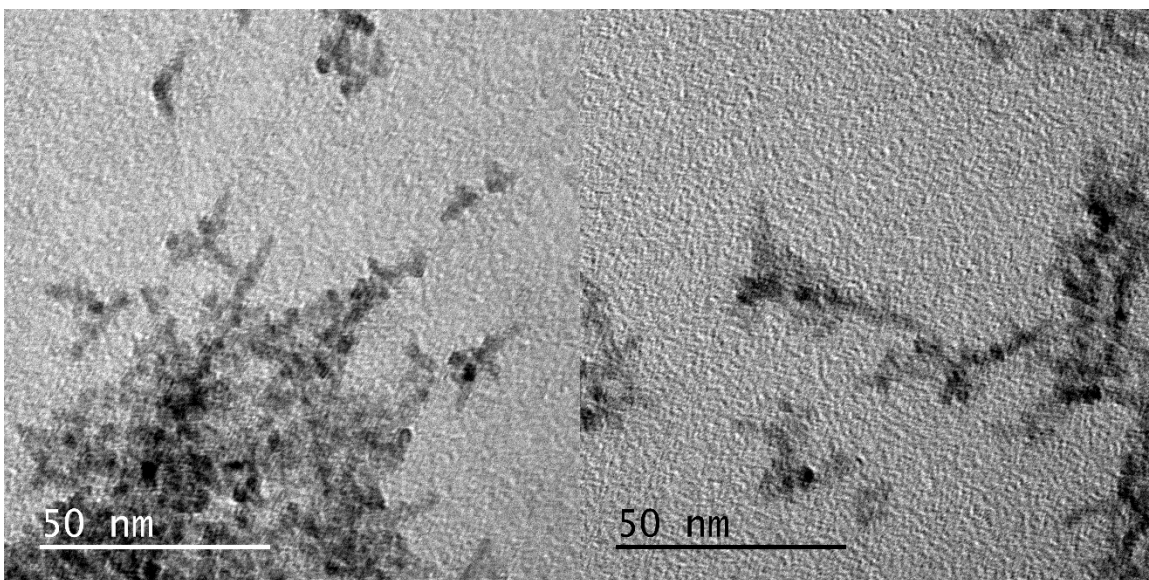


**Figure S1.**

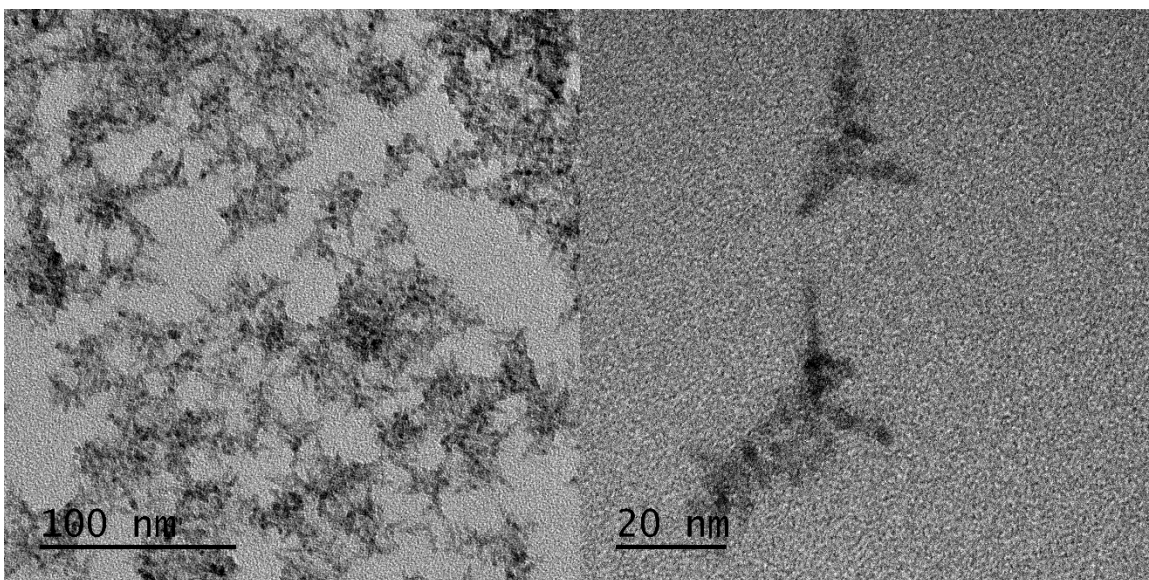
Photoluminescence excitation spectrum of Mn<sup>2+</sup>:ZnSe synthesized with Ph<sub>2</sub>Se<sub>2</sub>. The emission was detected at 584 nm while scanning excitation wavelengths from 300-500 nm. The PLE spectrum exhibits the characteristic NC first excitonic feature near 390 nm along with a continuous increase in intensity at higher energies.



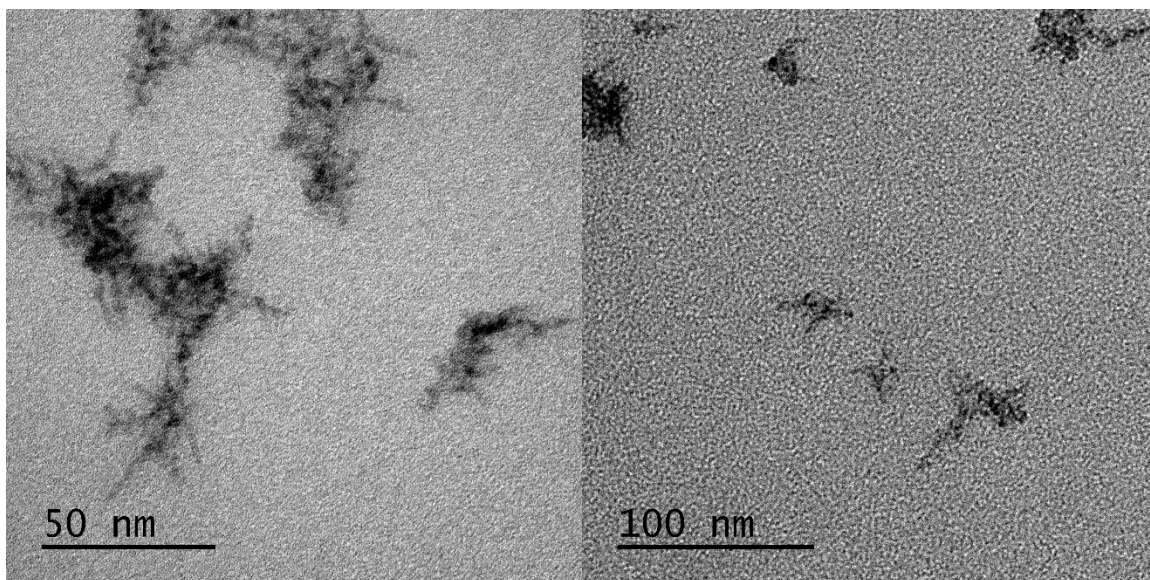
**Figure S2.**  
TEM images of **1**. Additional images of the NCs demonstrating branching patterns.



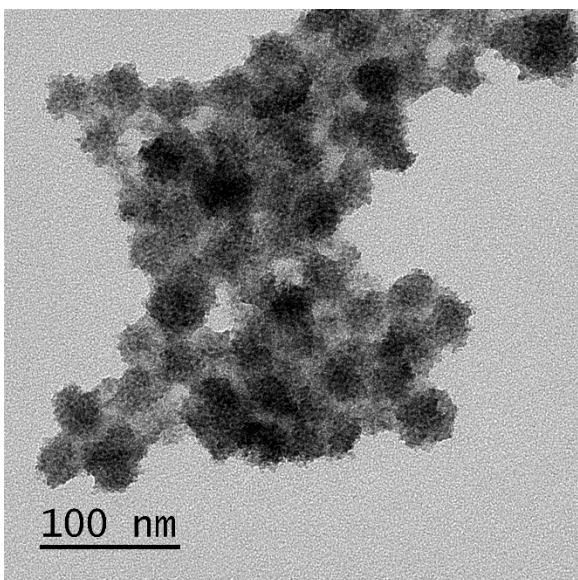
**Figure S3.**  
TEM images of **2**. Additional images of the NCs demonstrating branching patterns.



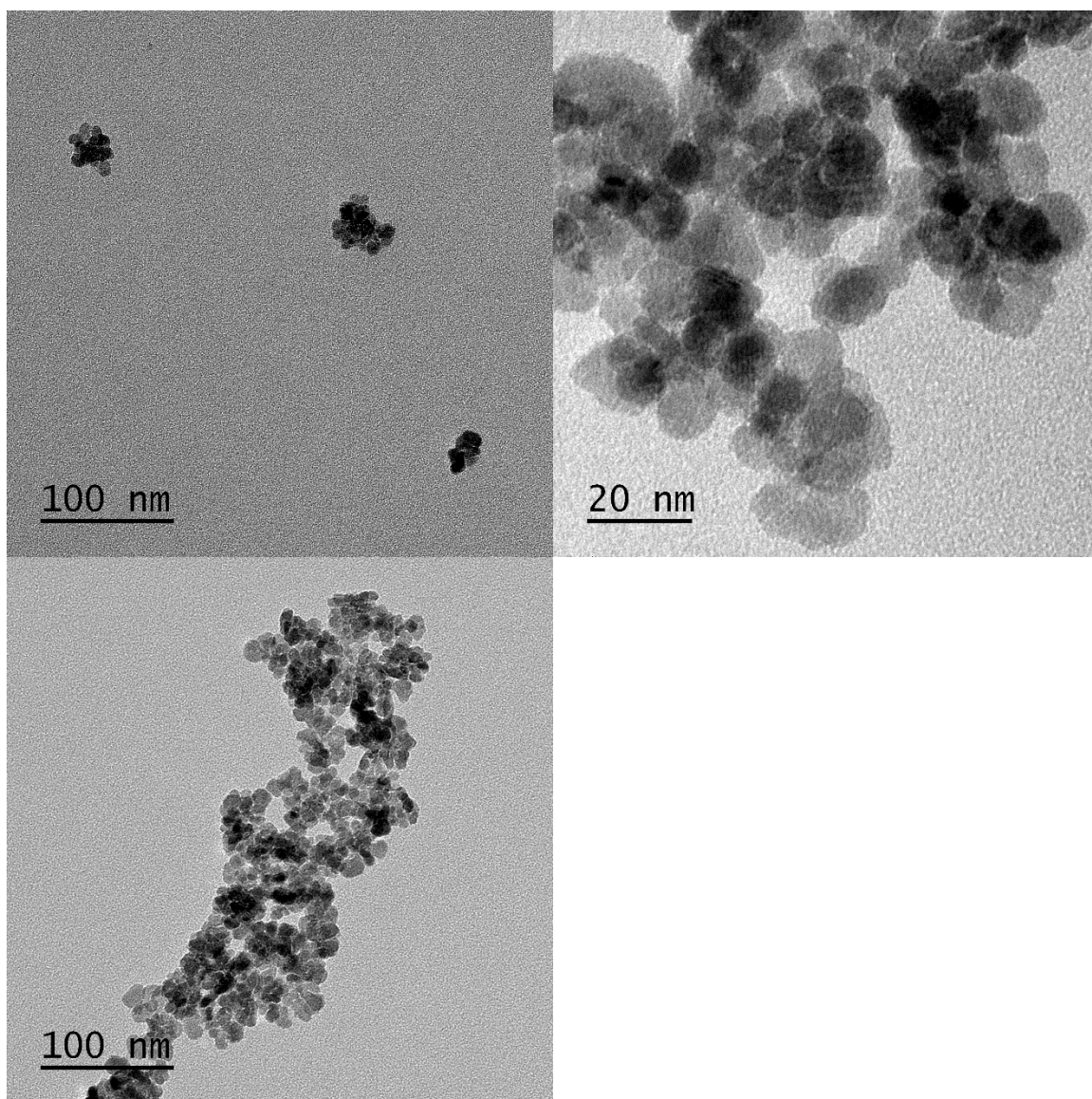
**Figure S4.**  
TEM images of **3a**. Additional images of the NCs demonstrating branching patterns.



**Figure S5.**  
TEM images of **3b**. Additional images of the NCs demonstrating branching patterns.



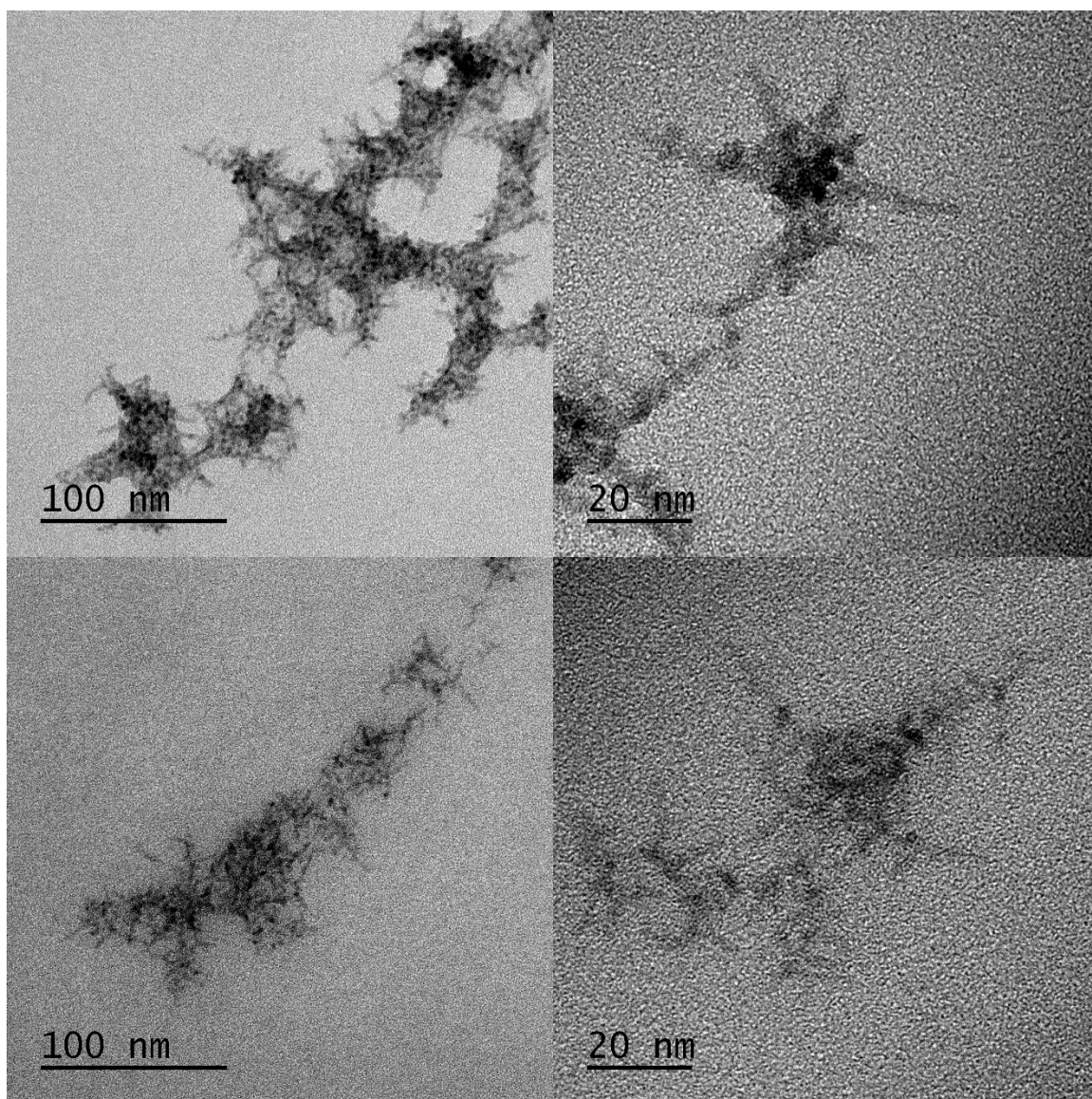
**Figure S6.**  
TEM image of **4**. Additional images of the NCs demonstrating aggregation.



**Figure S7.**

TEM images of **5**. Additional images of the NCs demonstrating aggregation and formation of larger and smaller assemblies.





**Figure S8.**  
TEM images of **1** prepared using  $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$  (top) and  $\text{Mn}(\text{OAc})_2 \cdot 4\text{H}_2\text{O}$  (bottom).