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Supporting Information

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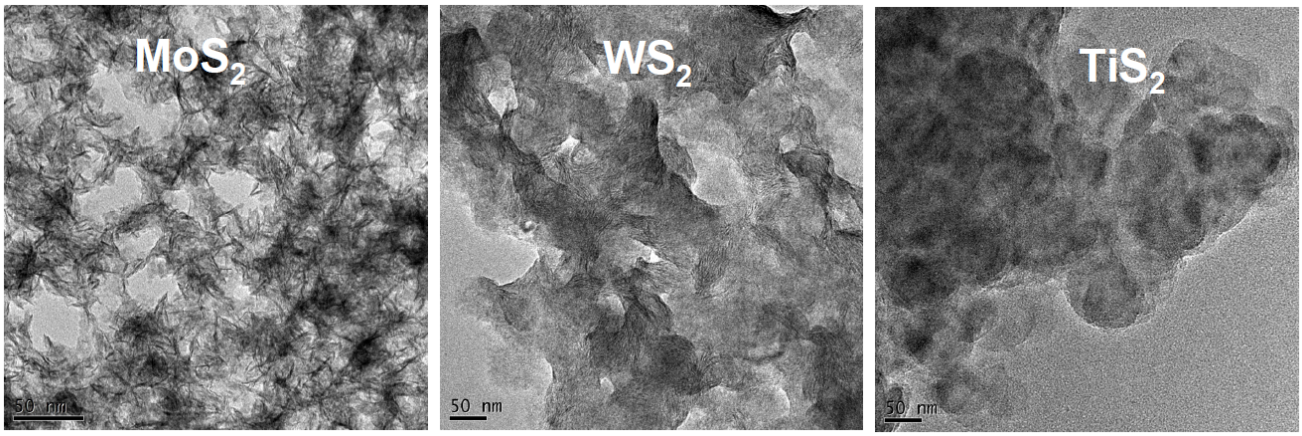
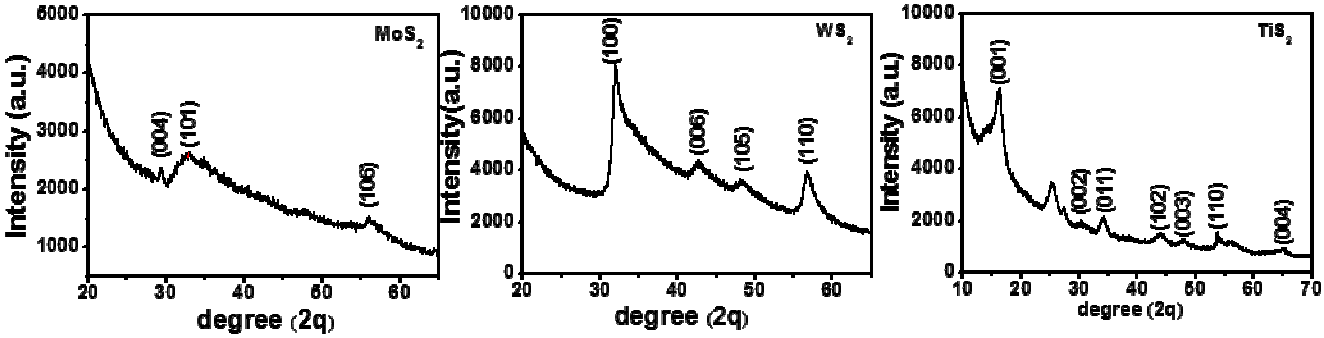
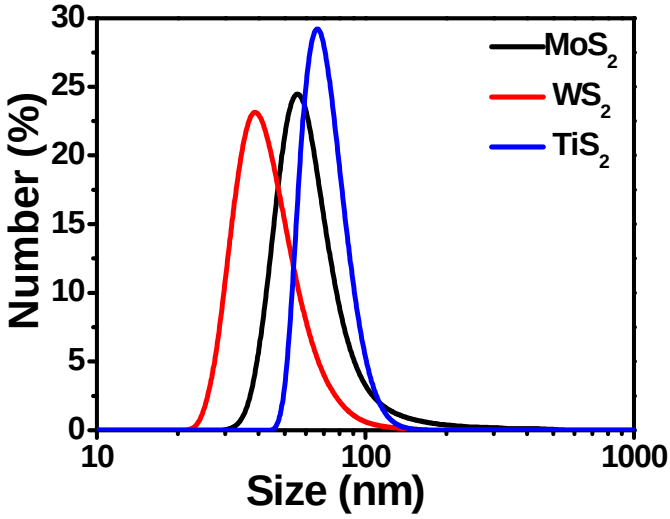


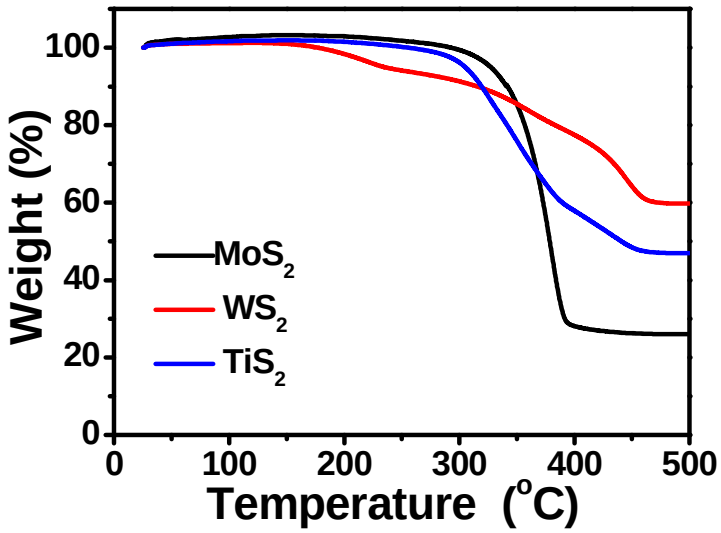
Supporting Figure S1 TEM images of the MoS_2, WS_2, and TiS_2 nanoflakes synthesized by the high-temperature thermal decomposition method.



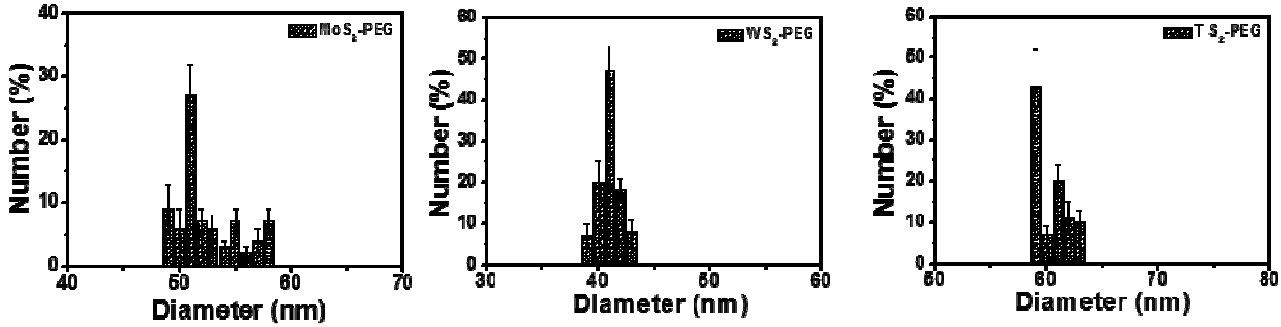
Supporting Figure S2. XRD spectra of the MoS_2, WS_2, and TiS_2 nanosheets under the ultrasonic decomposition each flakes.



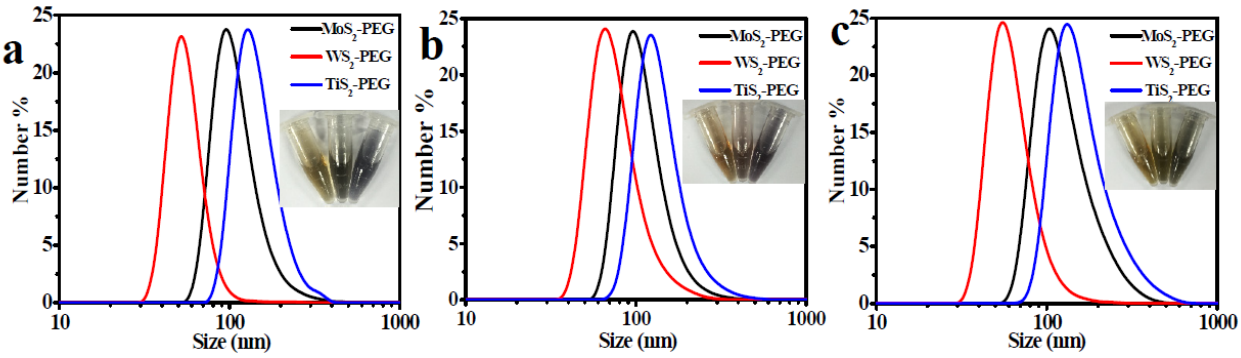
Supporting Figure S3 DLS size distribution of MoS_2, WS_2, and TiS_2 nanosheets in water.



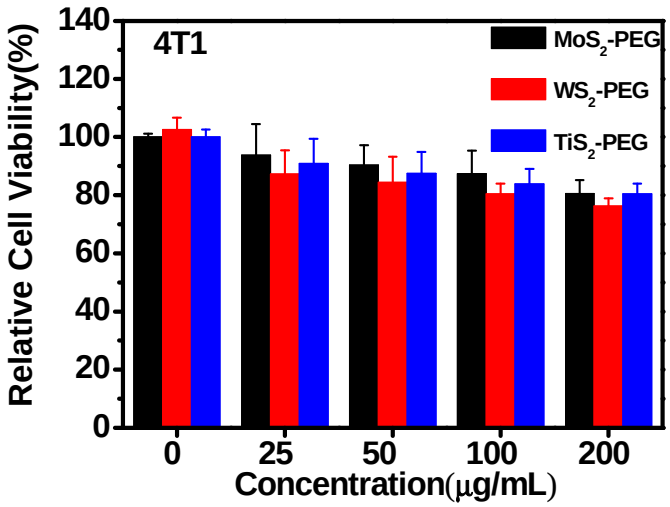
Supporting Figure S4 The weight percentage of MoS_2, WS_2, and TiS_2 in PEGylated MoS_2, WS_2, and TiS_2.



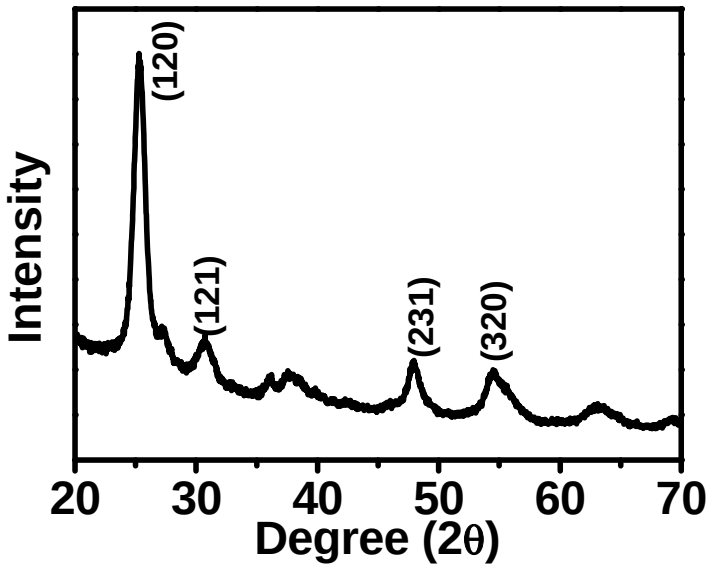
Supporting Figure S5 The size of PEGylated MoS_2, WS_2, and TiS_2 under TEM.



Supporting Figure S6 DLS size distribution of PEGylated MoS_2, WS_2, and TiS_2 in different solutions. **a**) Phosphate buffered saline (PBS). **b**) RMPI-1640 cell medium, and **c**) fetal bovine serum (FBS).



Supporting Figure S7 Relative cell viability of 4T1 cell line after incubation with PEGylated MoS2, WS2, and TiS2 respectively at different concentrations (in terms of TMDC weight concentrations) for 24 h.



Supporting Figure S8 XRD spectrum of the PEGylated TiS_2 after 3 months standing in PBS solution at room temperature. It can be found the TiS_2 nanosheets were hydrolyzed to form TiO_2 nanostructures.