Supplementary Information

Photocatalytic Degradation of Chlorpyrifos with Mn-WO_3/SnS_2 Heterostructure

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Table S1: Average crystallite sizes of nanomaterials

Material	**Average crystallite size (nm)**
Pristine WO_3	43
Mn-WO_3	40
Mn-WO_3/SnS_2	40
WO_3/SnS_2	40
Pristine SnS_2	17

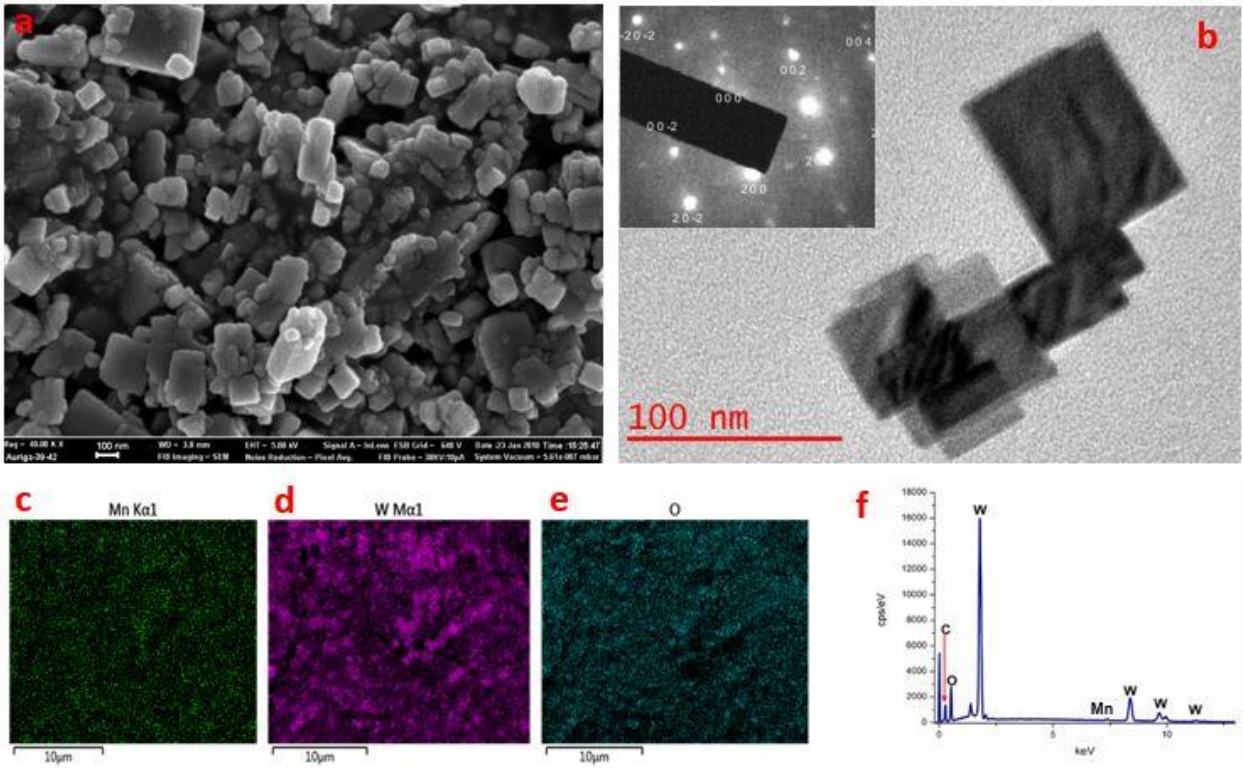

Figure S2: (a) FESEM image of pristine Mn-WO_3, **(b)** TEM image of Mn-WO_3, **(c)-(e)** elemental mapping, and **(f)** EDX spectrum of Mn-WO_3 nanoparticles

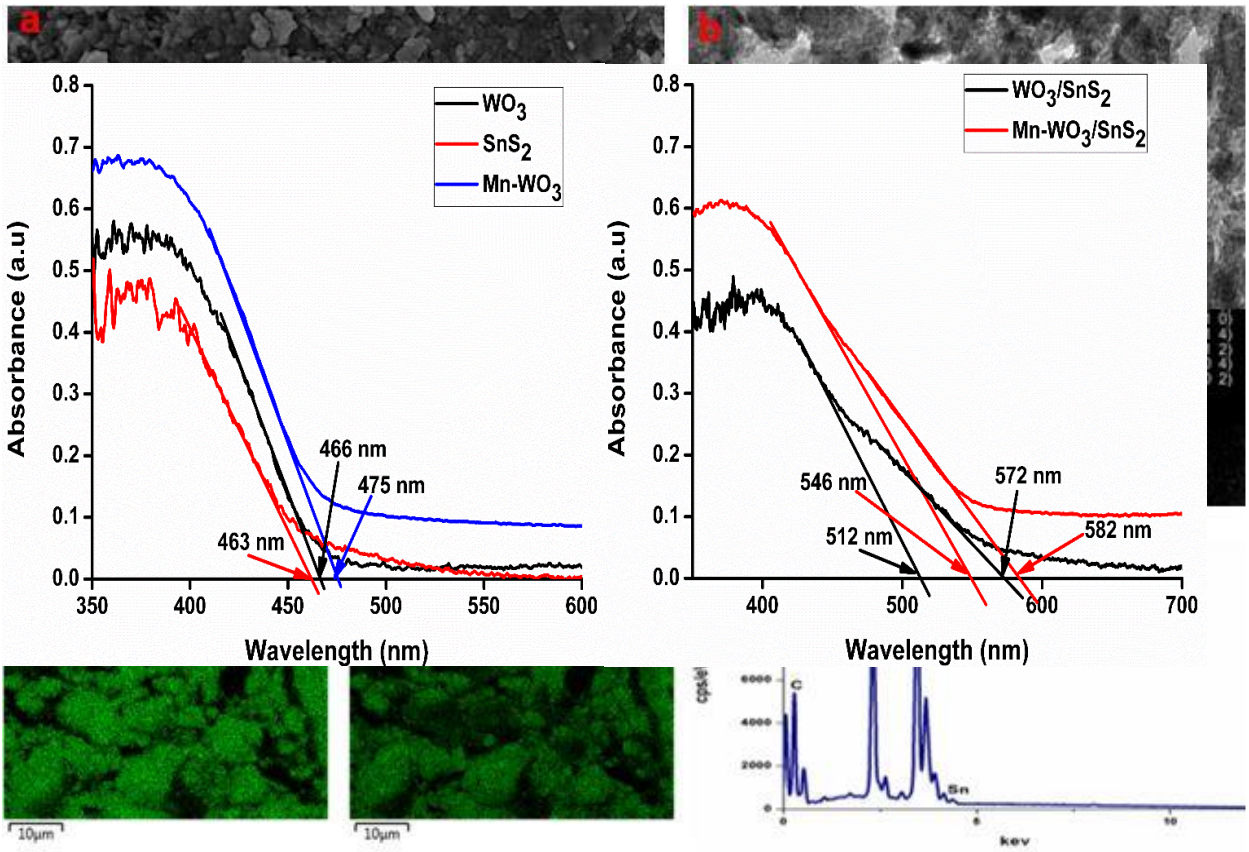

Figure S3: (a) FESEM image of pristine SnS_2, **(b)** TEM image of SnS_2 (inset is the corresponding SAED image), **(c)-(d)** elemental mapping, and **(e)** EDX spectrum of SnS_2 nanoparticles

Figure S4: Absorption spectra of WO_3, SnS_2, Mn-WO_3, WO_3/SnS_2, and Mn-WO_3/SnS_2

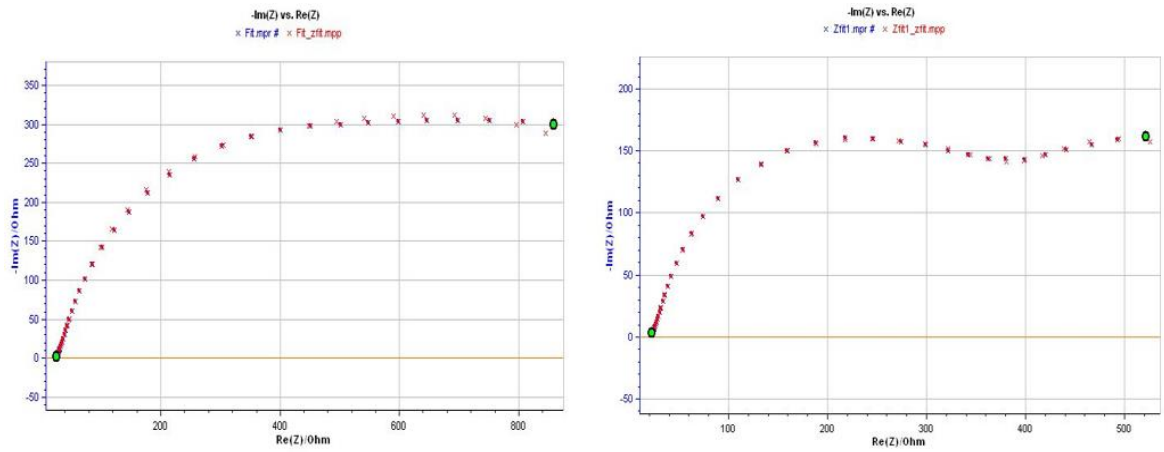

Figure S5: EIS spectra showing the fitted spectra when obtaining the Randles circuit for (a) WO_3 and Mn-WO_3, and (b) SnS_2, WO_3/SnS_2 and Mn-WO_3/SnS_2

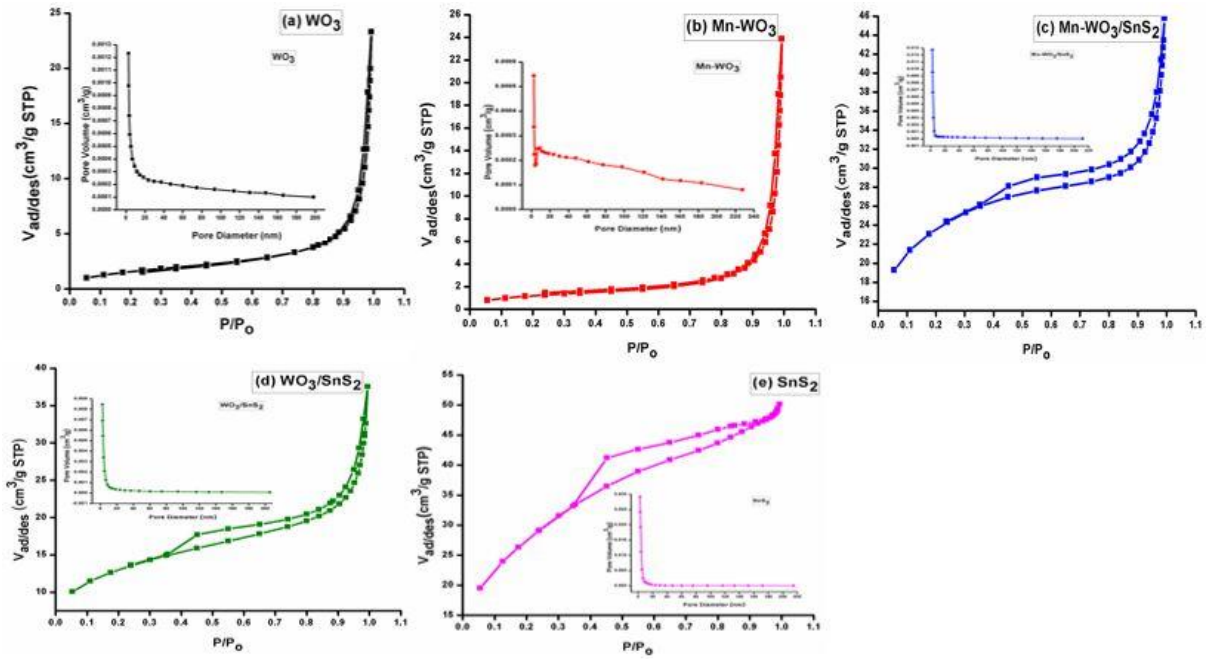

Figure S6: (**a-e**) N_2 adsorption-desorption isotherm of (a) WO_3, (b) Mn-WO_3, (c) Mn-WO_3/SnS_2, (d) WO_3/SnS_2, and (e) SnS_2 (**insets** are pore volume graphs)

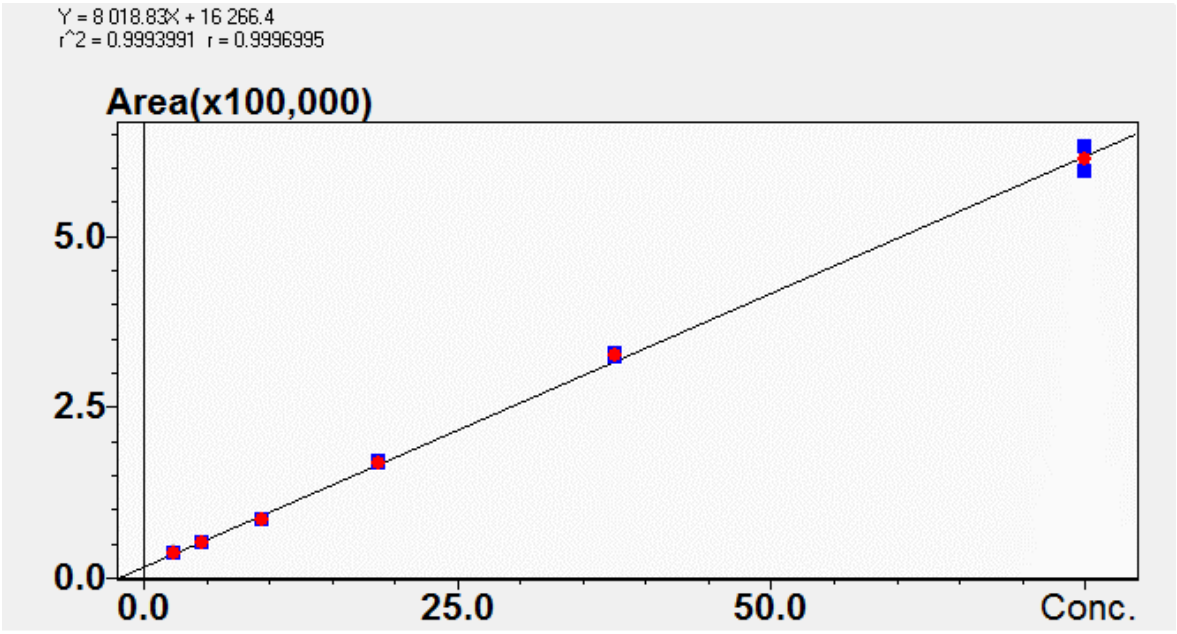

Figure S7: Calibration curve of chlorpyrifos standards from 3.125 to 75 ppb

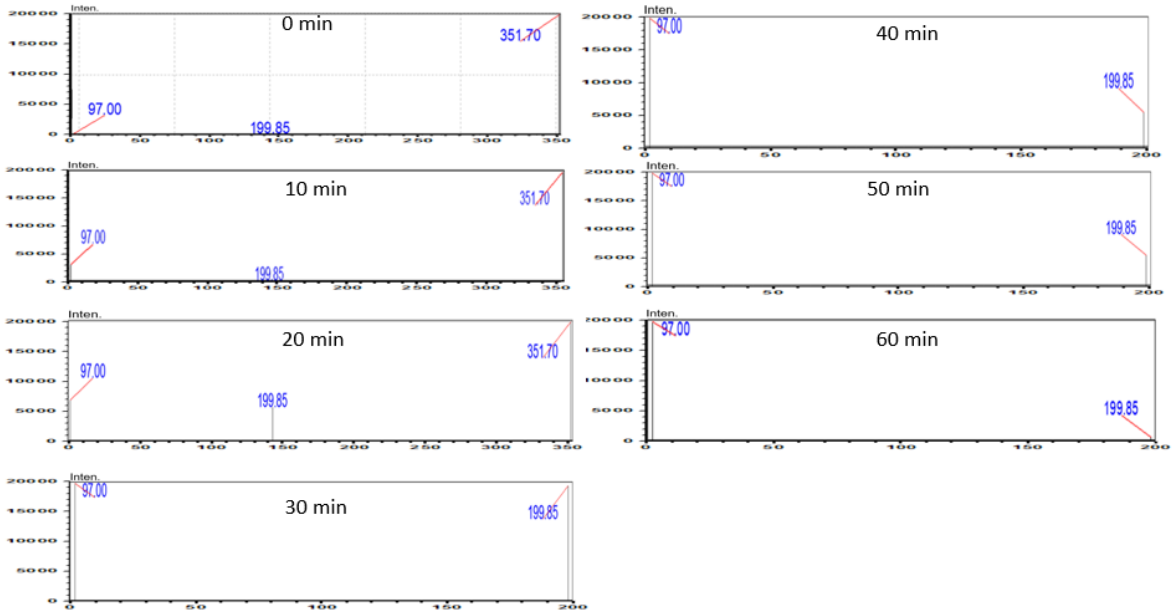

Figure S8: Mass spectra showing m/z ratios from 0 to 60 minutes

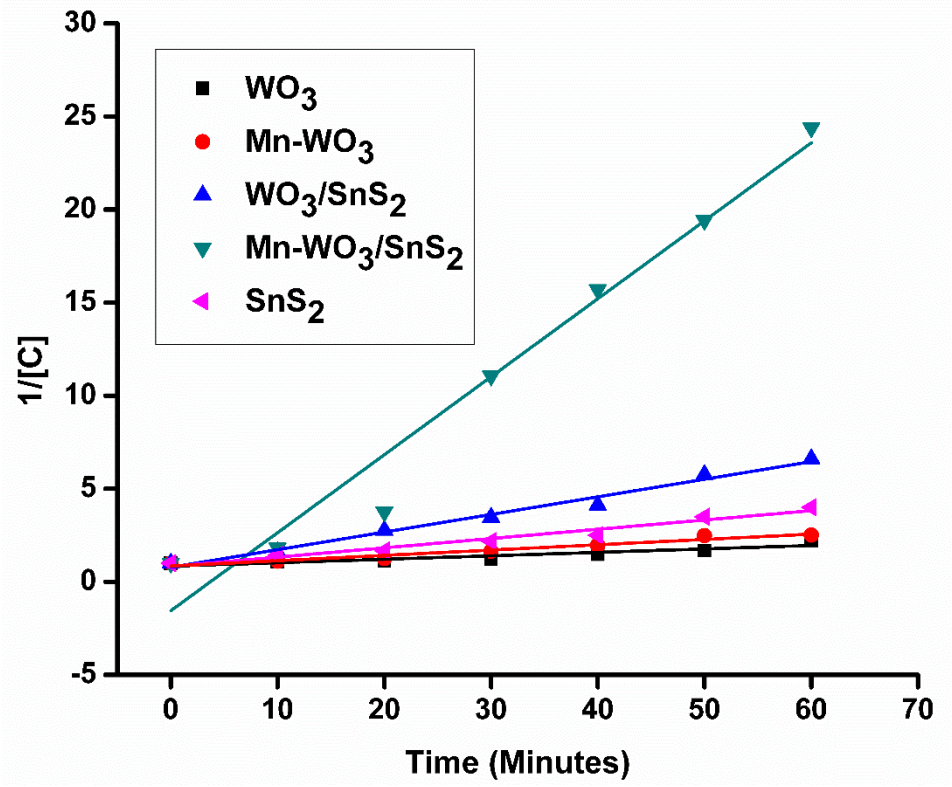

Figure S9: Fitted second order reaction kinetics graphs of the nanoparticles