## **Supporting Information**

## Near room temperature thermocatalysis: a promising avenue for the degradation of polyethylene using NiCoMnO<sub>4</sub> powders

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**Figure S1.** FTIR spectra (a) and C.I. graph (b) of physical mixtures with different catalyst content after aging at 50 °C in air for 90 days.



**Figure S2.** FTIR spectra of composite films with different catalyst dosage after aging at 20 °C in air for 90 days



Figure S3. XRD pattern of catalyst before and after thermodagradation reaction



**Figure S4.** FT-IR spectra of composite films filled with NiCoMnO<sub>4</sub> and another specific catalyst after thermal degradation.



**Figure S5.** FT-IR spectra of methylene blue before and after thermal degradation by specific transition metal sulfide.