

Preparation of peelable coating films with a metal organic framework (UiO-66) and self-crosslinkable polyurethane for the decomposition of methyl paraoxon

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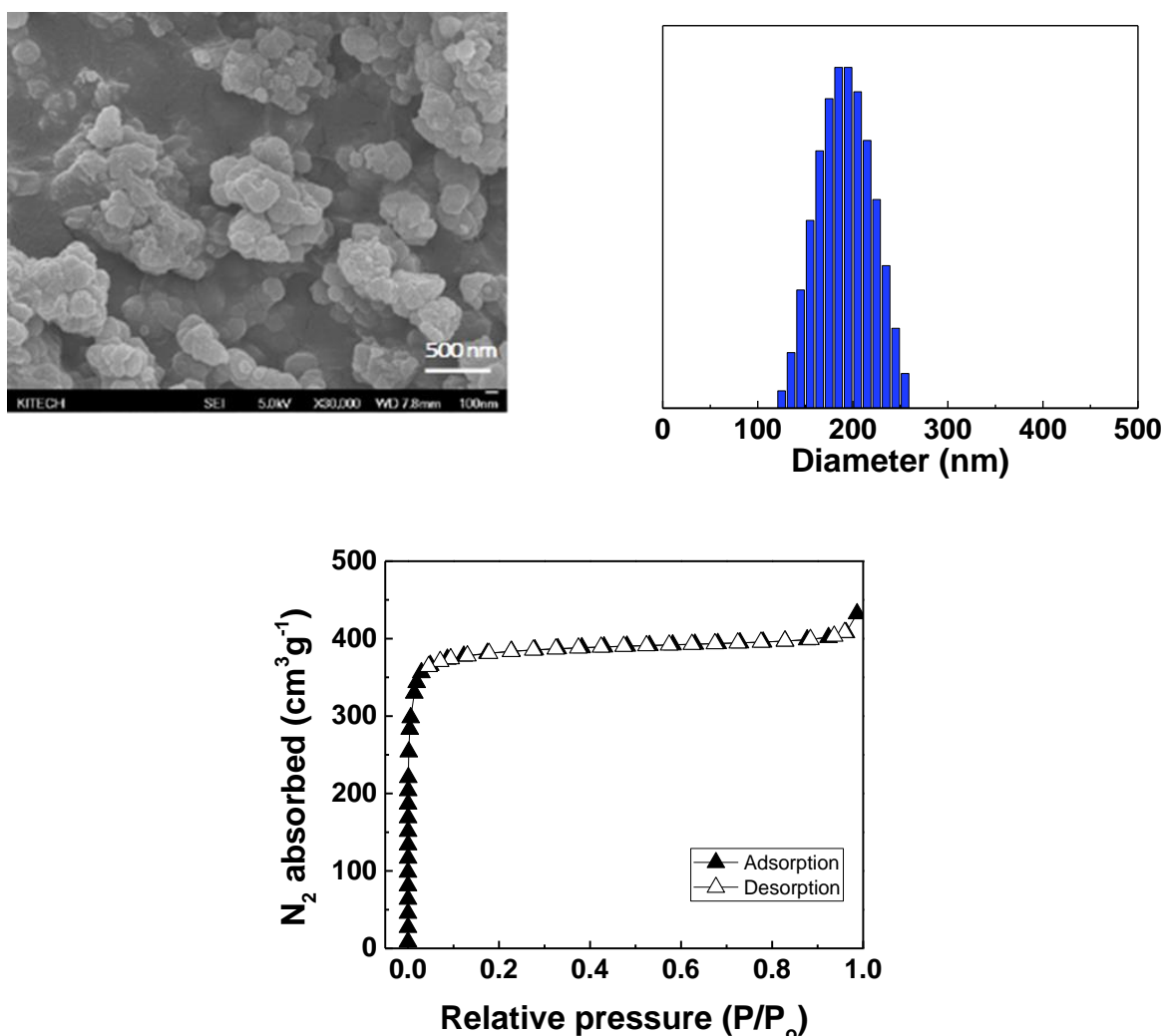


Figure S1. The FE-SEM image, average size and N₂ isotherm of synthesized UiO-66.

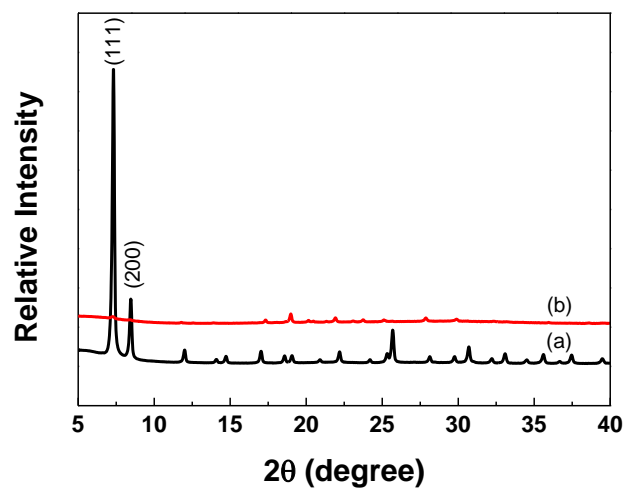


Figure S2. PXRD patterns of UiO-66 particles: (a) pristine and (b) immersed in 0.45 mol/L N-ethylmorpholine aqueous solution for 24 h

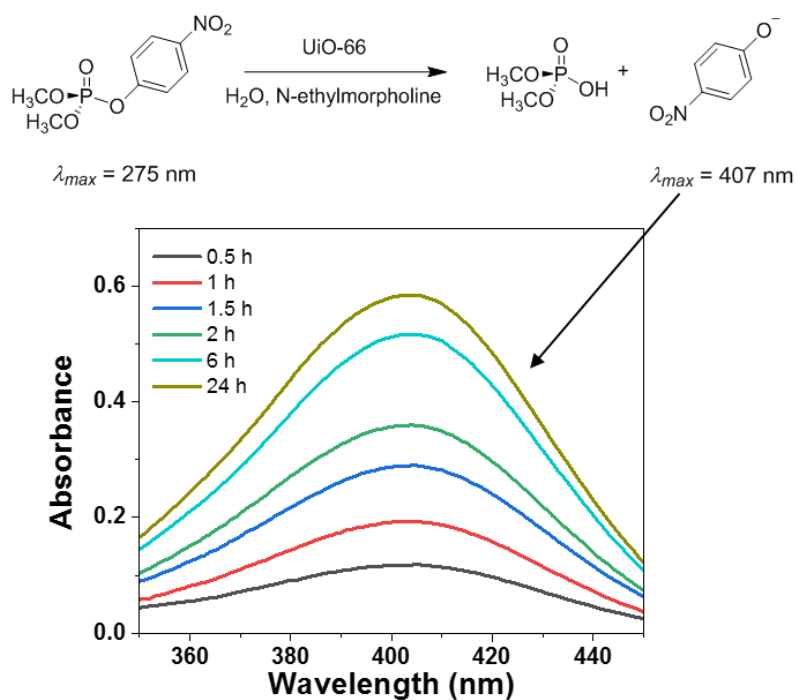


Figure S3. Hydrolysis of methyl paraoxon (MPO) and UV-Vis spectra of the degradation of MPO by a 49.5 wt% UiO-66-dispersed DSPD film as a function of the treatment time.

Experimental method

The rate constant of MPO decomposition was calculated by using pseudo-first order reaction kinetics. The equation $\ln(C_t/C_0) = -kt$ was used, where C_t is the concentration of MPO at time t , C_0 is the initial concentration of MPO, and k pseudo-first-order rate constant. The rate constant of MPO decomposition is increased by the amount of UiO-66 in the composite films.

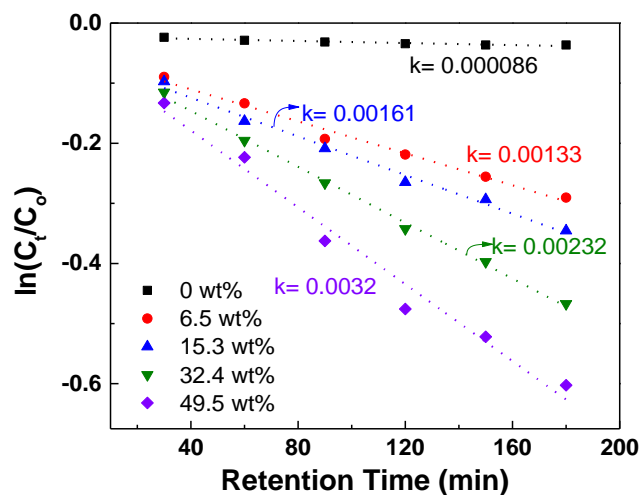


Figure S4. The $\ln(C_t/C_0)$ vs t plot for MPO decomposition (dot line are calculated by linear fit).

Experimental method

Dumbbell-shaped UiO-66/DSPD composite films were immersed in the test solution for 0.5, 1, 3, 5, 10 and 30 min, respectively, and then they were dried for 3 h prior to tensile test.



Figure S5. Sample preparation for measuring the mechanical property changes of UiO-66/DSPD composite films after MPO decomposition test.

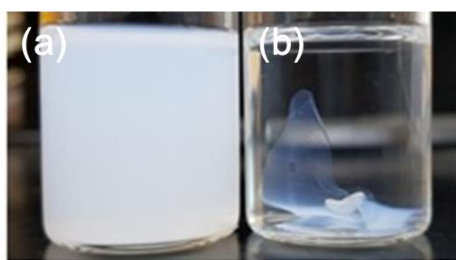


Figure S6. Polar solvent (methanol) resistance of (a) DSPD films without APTES and (b) DSPD films containing 2.5 wt% of APTES.