Electronic Supplementary Information

UV absorber co-intercalated layered double hydroxides as efficient hybrid UV-shielding materials for polypropylene

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Preparation of NO_3-LDH

$Mg(NO_3)_2 \cdot 6H_2O$ (20 mM), $Zn(NO_3)_2 \cdot 6H_2O$ (10 mM) and $Al(NO_3)_3 \cdot 9H_2O$ (10 mM) were dissolved in 50 mL of deionized water to form a salt solution. NaOH (76 mM) were dissolved in 50 mL of deionized water to form an alkaline solution. Subsequently, the salt solution and alkaline solution were synchronously dropped into a flask with vigorous stirring at room temperature under N_2 atmosphere within 10 min. The formed semident was crystallized at 95 °C for 6 h in a water−bath with vigorous stirring under a N_2 atmosphere. The obtained precipitate was centrifuged and washed for five cycles with deionized water and dried in oven at 90 °C for 12 h.

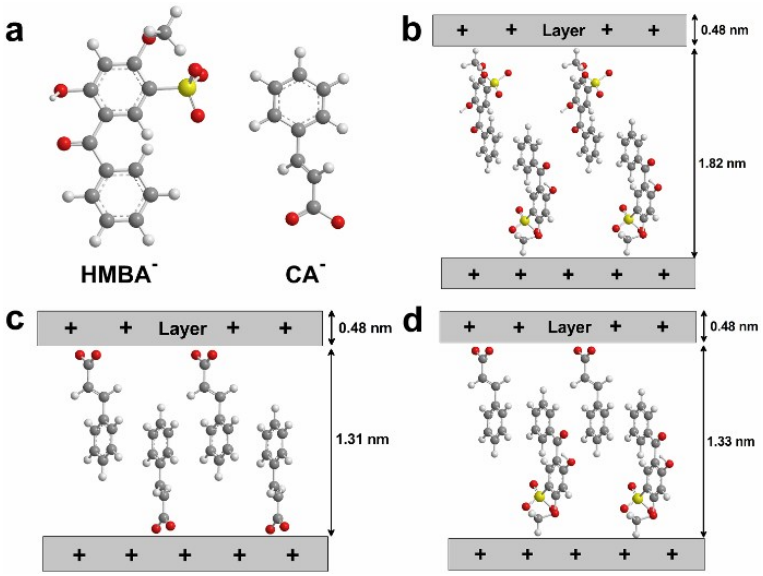

Fig. S1. Models of HMBA and CA (a), the possible arrangements of HMBA and/or CA in the interlayer of HMBA-LDH (b), CA-LDH (c), and HMBA-CA-LDH.

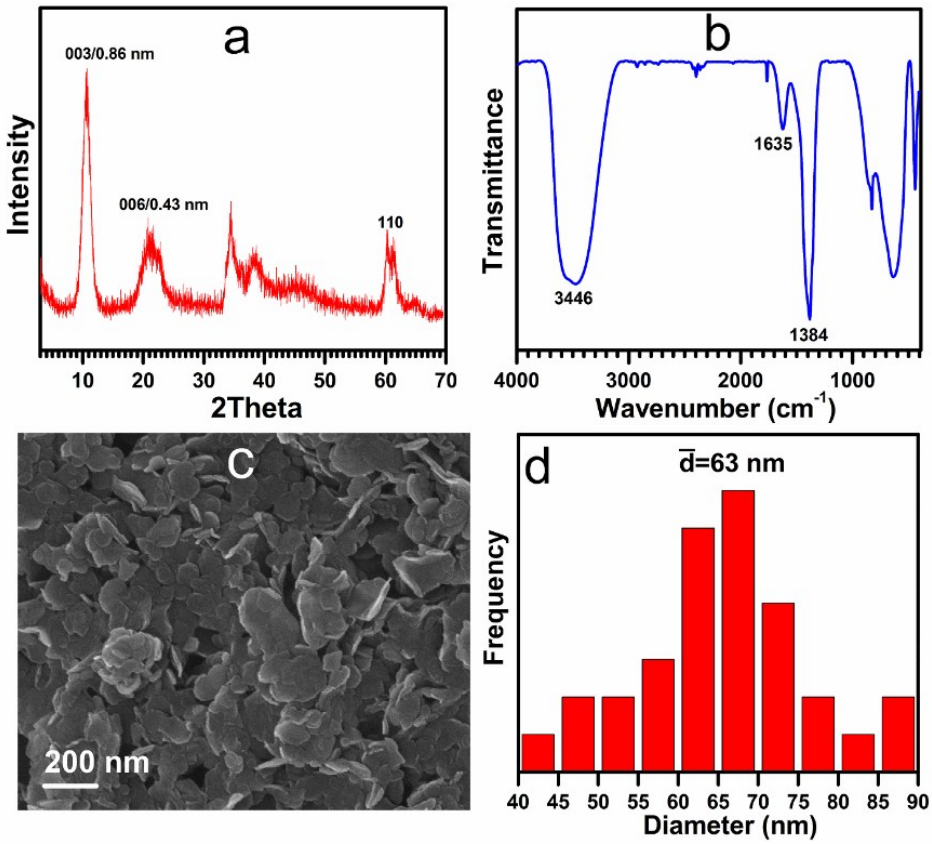

Fig. S2. XRD pattern (a), FT-IR spectrum (b), SEM image (c) and particle size statistic histogram (d) of NO_3-LDH.

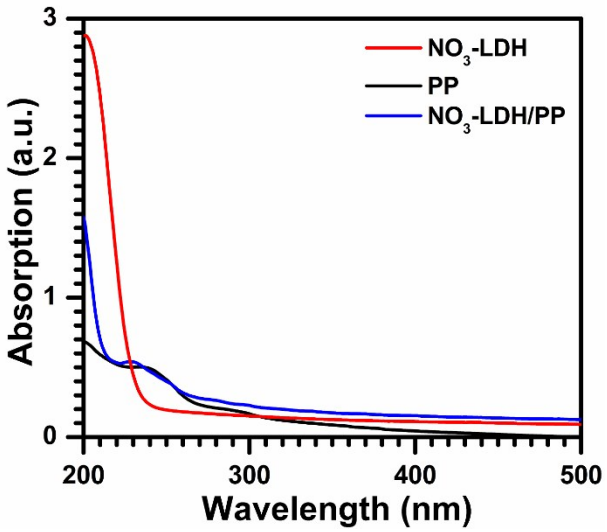

Fig. S3. UV-vis absorption spectra of NO_3-LDH, PP and NO_3-LDH/PP

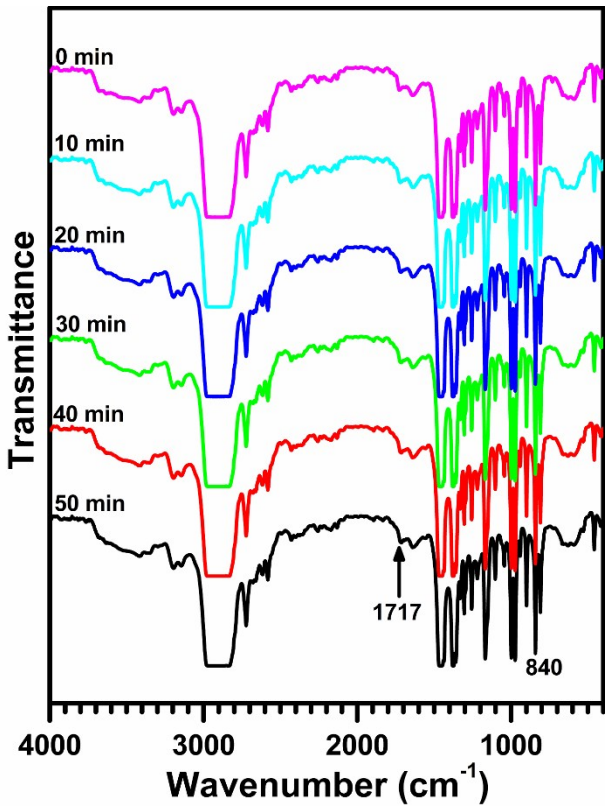

Fig. S4. FT-IR spectra of NO_3-LDH/PP before and after photoaging with different time.

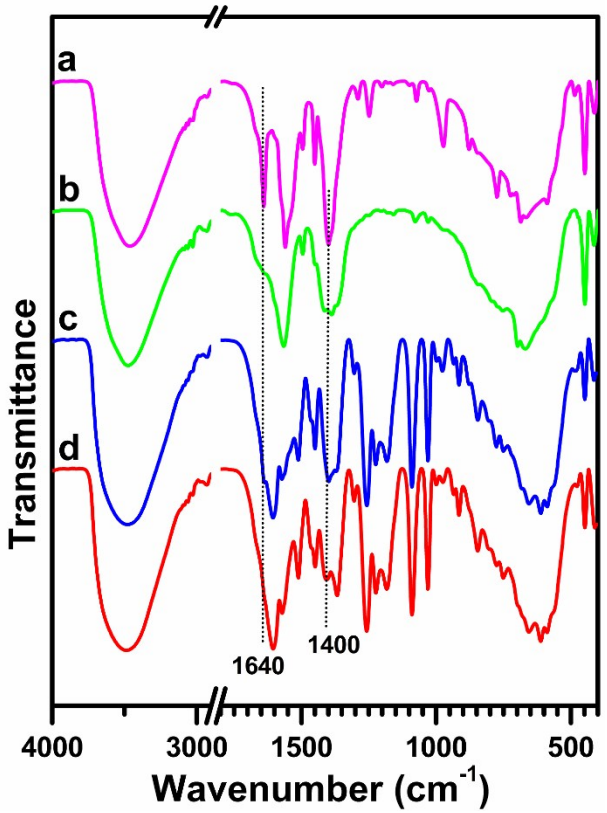

Fig. S5. FT−IR spectra of CA-LDH before (a) and after (b) 50 min UV irradiation, HMBA–CA-LDH before (c) and after (d) 50 min UV irradiation.

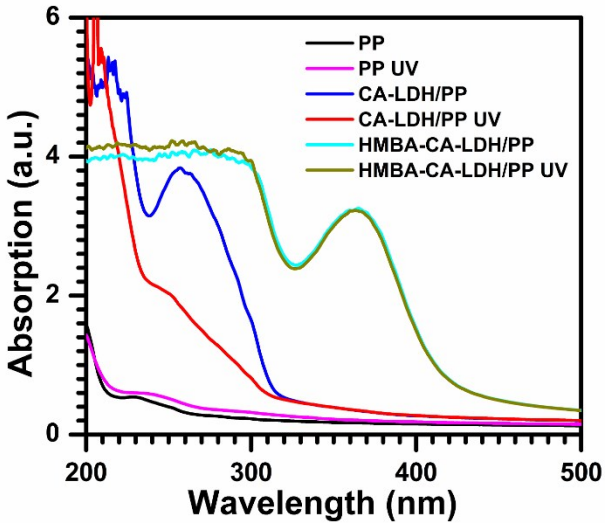

Fig. S6. UV-vis absorption spectra of PP, CA-LDH/PP and HMBA-CA-LDH/PP before and after 50 min UV irradiation