

Electronic Supplementary Information (ESI)

Characteristics and adsorption behavior of typical microplastics in long-term accelerated weathering simulation

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Carbonyl index (CI):

CI is defined as the ratio of the peak area of the carbonyl absorption peak to the peak area of the reference peak (methylene). The specific calculation formula is as follows:

$$CI = \frac{C=O(\text{Peak area})}{-CH_2(\text{Peak area})}$$

The spectral range of C=O is 1780-1600 cm^{-1} , and the peak position of the reference peak methylene (-CH₂) is 1500-1420 cm^{-1} .

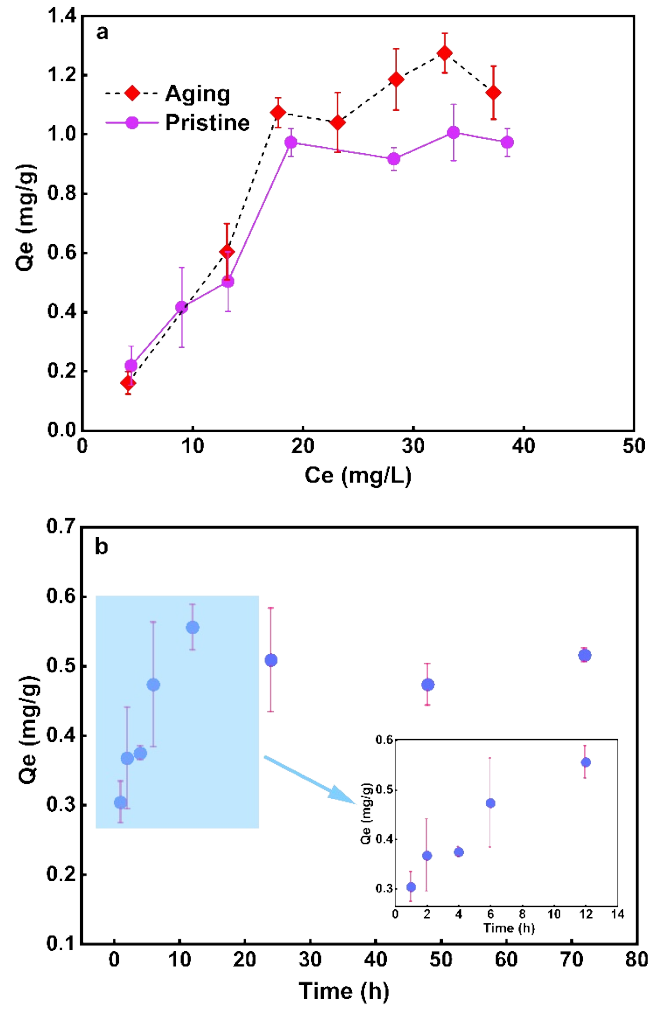


Figure S1. (a) Adsorption OFL isotherm of microplastics PE-125 before and after aging for 60 days, and (b) Adsorption OFL kinetics of PE-125

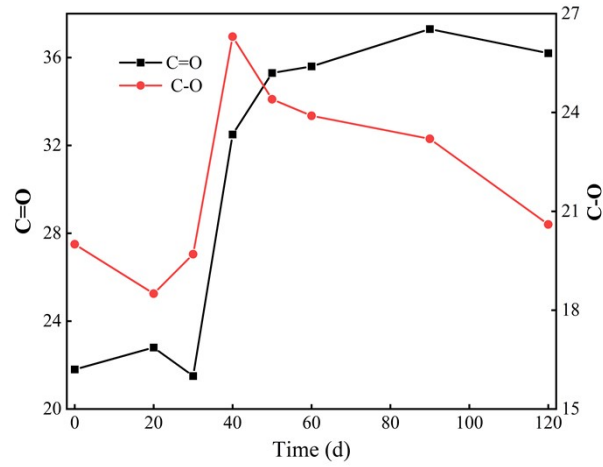


Figure S2. The changes of PBAT oxygen content with weathering time.

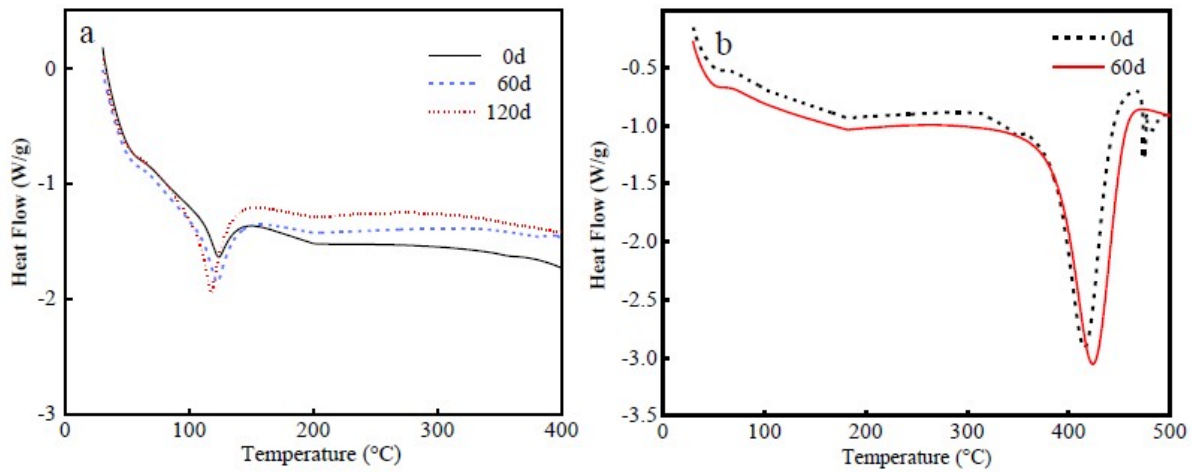


Figure S3. DSC diagrams of PE and PS before and after aging, (a) DSC chart of microplastic PE aging 0, 60, 120 d; (b) DSC chart of PS.

Table S1. The structure of three plastics.

Polyethylene (PE)	$\text{-(CH}_2\text{-CH}_2\text{)}_n\text{-}$
Polystyrene (PS)	$\text{-(CH}_2\text{-CH(C}_6\text{H}_5\text{))}_n\text{-}$
Poly (butyleneadipate- co-terephthalate) (PBAT)	$\text{-(O-CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{-O-C(=O)-CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{-C(=O)-)}_n\text{-(O-CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{-O-C(=O)-C}_6\text{H}_4\text{-C(=O)-)}_m\text{-}$

Table S2. Comparison of measured and predicted CI.

Time(d)	PF-30			PE-125		
	measured value	predictive value	Standard Deviation	measured value	predictive value	Standard Deviation
a-80	0.620	0.606	0.010	1.34	1.41	0.050
a-90	0.753	0.710	0.030	1.83	1.70	0.091
a-100	0.781	0.813	0.023	2.13	2.00	0.091