

Supplementary information

All-biomass-based Eco-friendly Waterproof Coating for Paper Based Green Packaging

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Table S1. The water barrier performance of H-LA-Wax coated paper compared with reported materials.

Materials		WVTR (g mm/m ² /day)	References
Conventional plastics	LDPE	0.71 ± 0.12	1
	PET	1.49 ± 0.11	1
	Carnauba wax	0.70 ± 2.8	2
	Starch	34.15 ± 3.16	2
Biopolymers coating	Protein	29.93 ± 4.57	2
	Pectin	140.14 ± 10.56	2
	PLA	177.465 ± 12.67	2
H-LA-Wax		5.05 ± 0.4	This work

Table S2. Materials cost calculation.

Materials	Price (\$/kg)	Quality (g/m²)	Cost (\$/m²)
Beeswax	5.58	7.6	0.0056
Hemicellulose	1.24	0.19	0.0002
Lauric acid	1.70	0.57	0.0010
Others			0.0015
Total cost			0.0083

Tape-peeling test

The tape-peeling test was performed according to the reported method with some modifications³⁻⁵. The grid lines were drawn on the waterproof coating by a Cross-Cut Tester. The adhesive tape (3M, Scotch 600) was applied to the coating surface under a 100 g weight for 30 s, and then peeled off from the surface, which is one cycle. The water contact angle of the coating was measured after every 4 cycles of tape peeling.

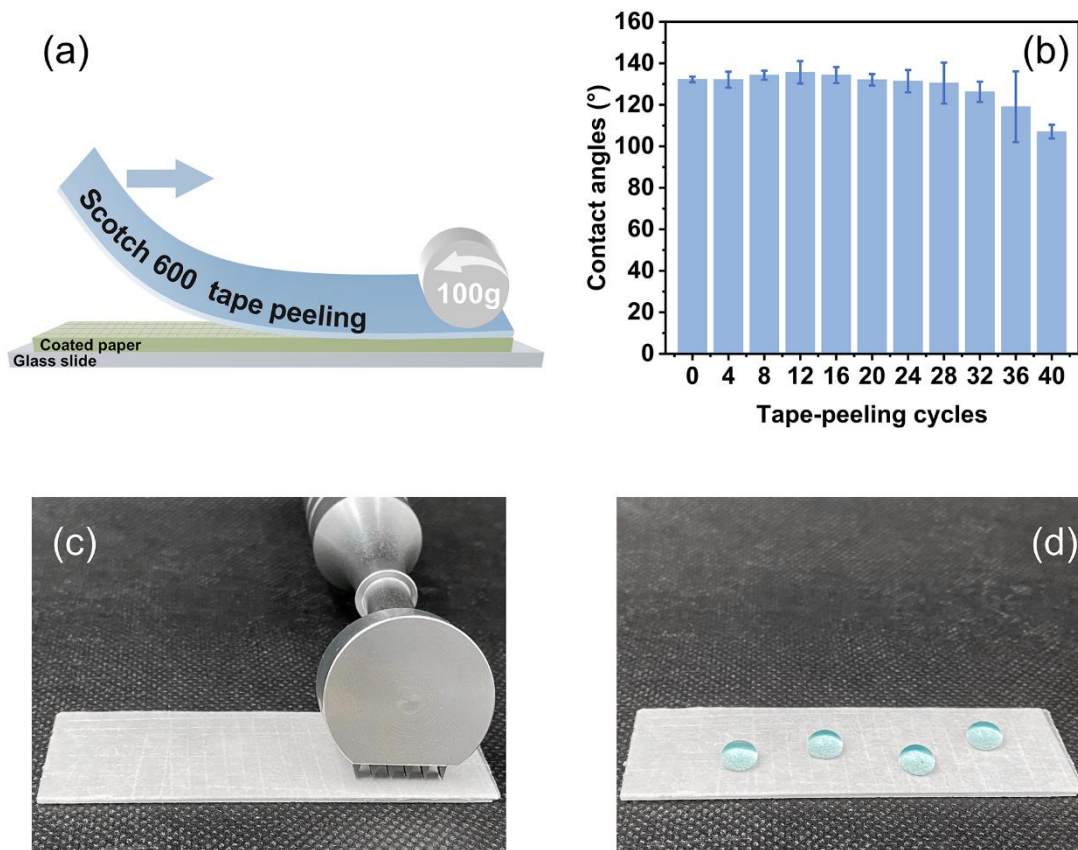


Fig. S1 (a) Schematic diagram of tape-peeling test; (b) Changes of water contact angles with different tape-peeling test cycles; (c) Scratching with a Cross-Cut Tester on the coated surface; (d) Surface hydrophobicity of the coated paper with 32 cycles tape-peeling test.

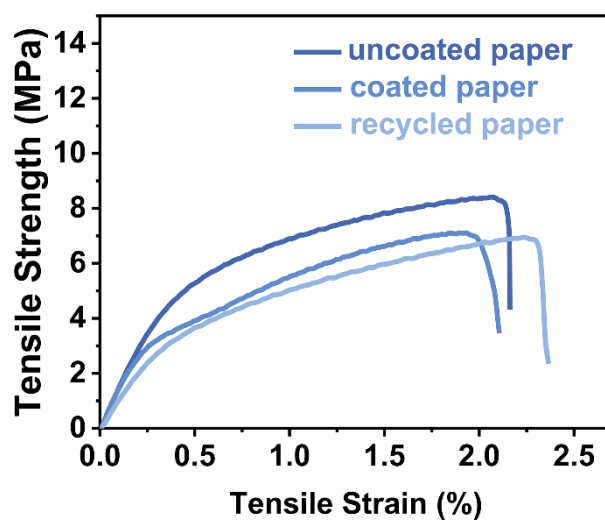


Fig. S2 The tensile stress-strain curves of the recycled paper.

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