Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supplementary Information

Self-repairing silicone coating for marine anti-biofouling

Chao Liu, Chunfeng Ma*, Qingyi Xie, Guangzhao Zhang*

Faculty of Materials Science and Engineering, South China University of Technology, Guangzhou 510640, P. R. China

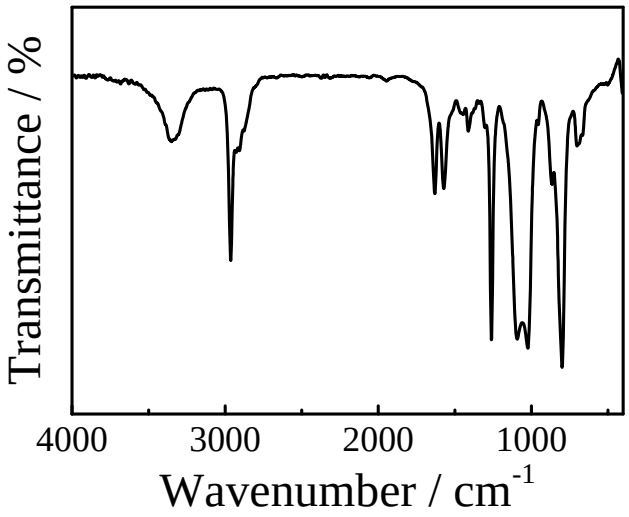


Fig. S1 FTIR spectrum for PDMS-PUa.

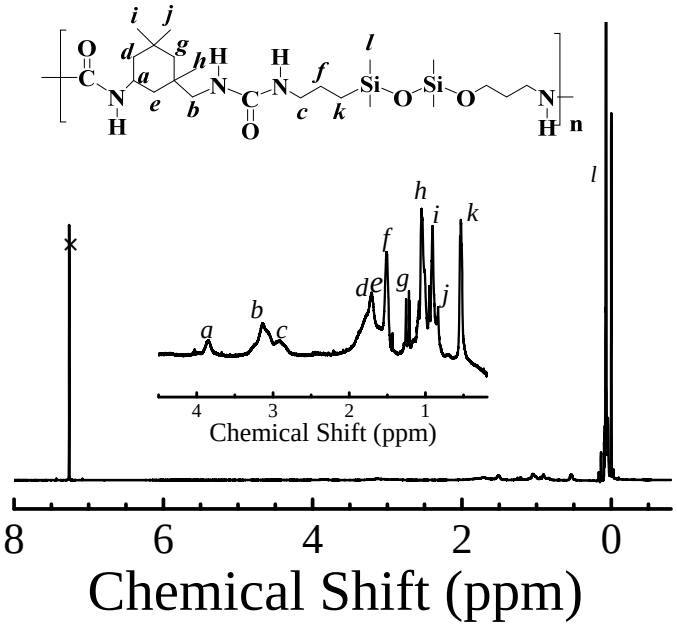


Fig. S2 ^{1}H NMR spectrum for PDMS-PUa

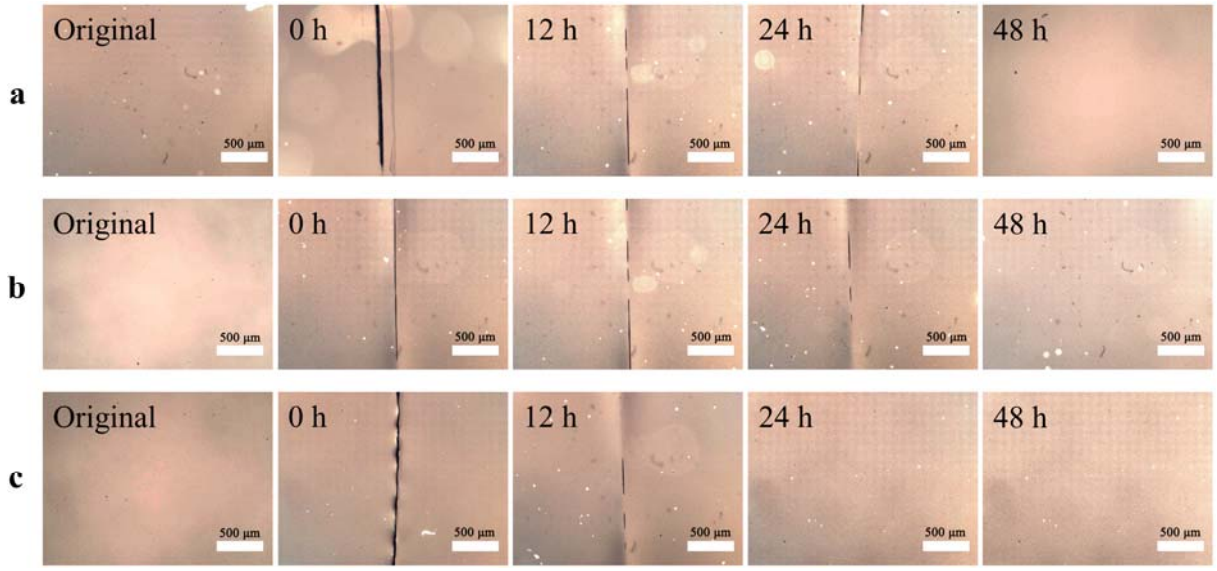


Fig. S3 Self-repairing of PDMS-PUa with different DCOIT content (wt%) imaged by an optical microscope (500 ×) at 25 °C. (a) 1.0 wt%; (b) 2.5 wt%; (c) 10.0 wt%

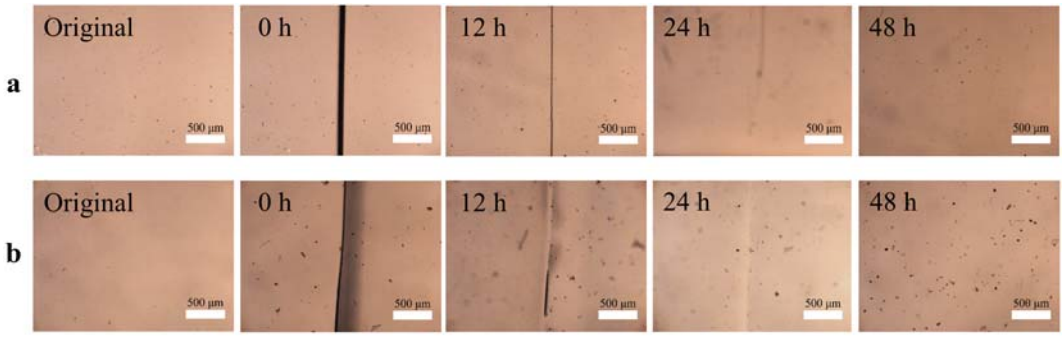


Fig. S4 Self-repairing process in ASW at room temperature imaged by an optical microscope (500 ×) (a) PDMS-PUa and (b) PDMS-PUa with 5.0 wt% DCOIT.

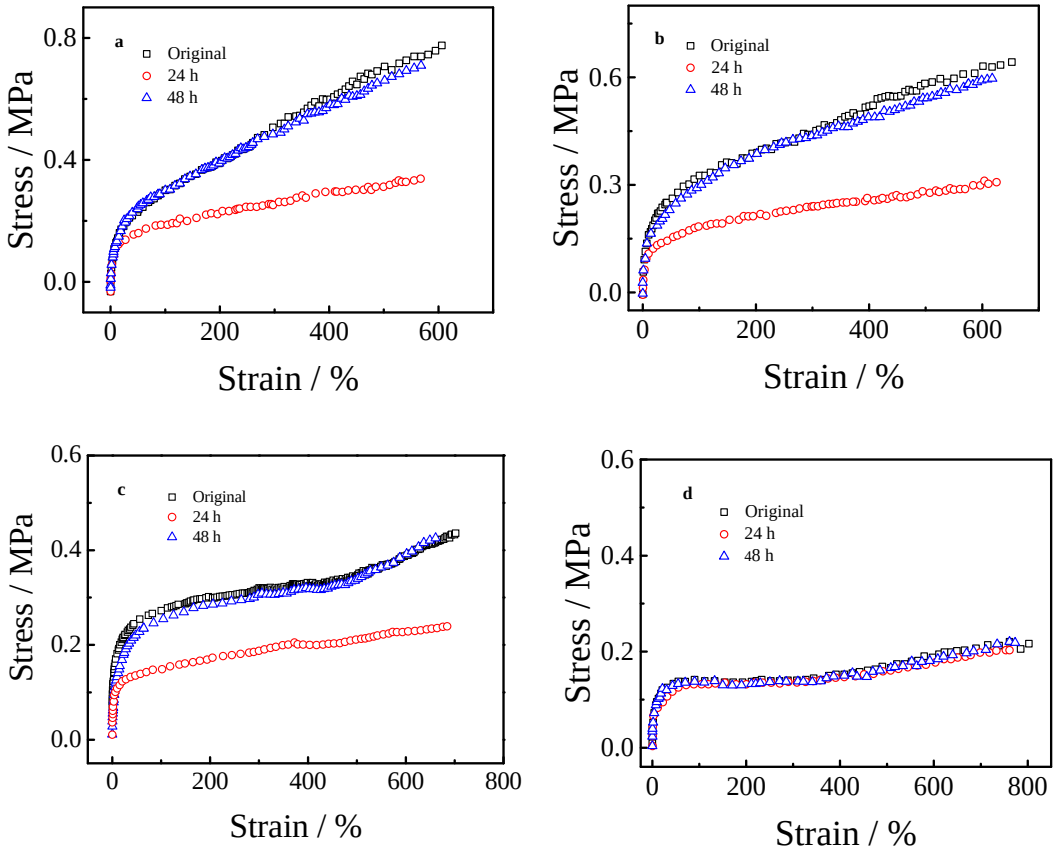


Fig. S5 Stress-strain curves of PDMS-PUa with different DCOIT content (a) 1.0 wt%; (b) 2.5 wt%; (c) 5.0 wt%; (d) 10.0 wt%.

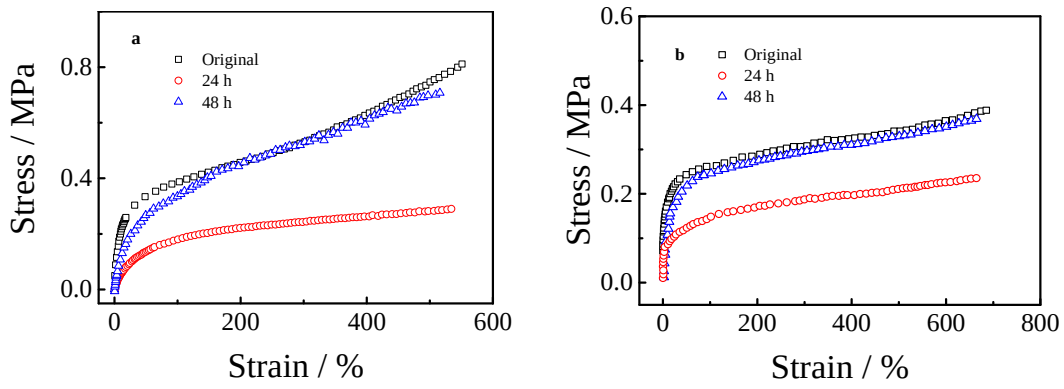


Fig. S6 Stress-strain curves of PDMS-PUa (a) and PDMS-PUa with 5.0 wt% of DCOIT (b) repaired in ASW at 25 °C.

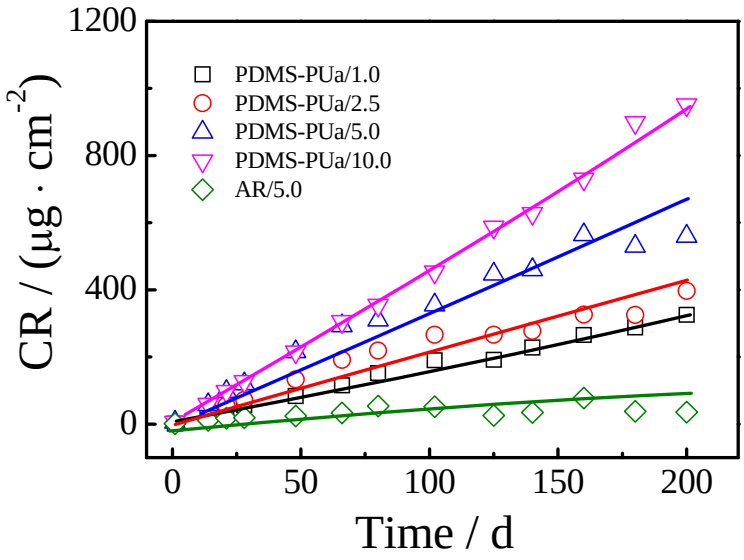
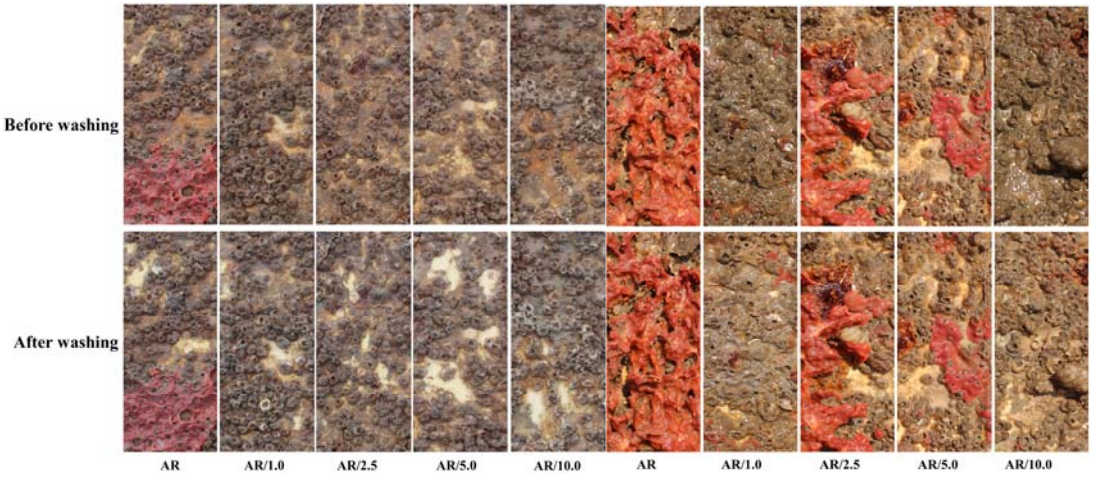


Fig. S7 Time dependence of the cumulative release (CR) of DCOIT from PDMS-PUa.



(a) 90 days (b) 180 days

Fig. S8 Images of tested panels coated with acrylic resin (AR)/DCOIT (the number is weight percentage of DCOIT) after immersion in seawater for 90 days (a) and 180 days (b).

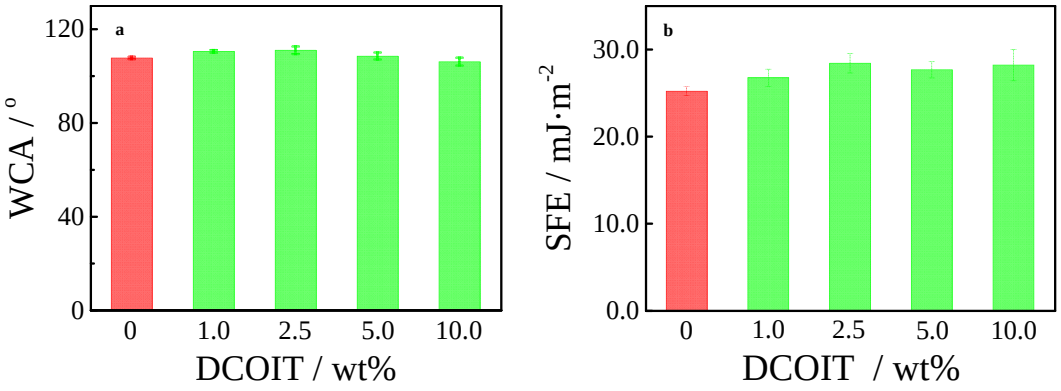


Fig. S9 (a) Water contact angle (WCA) and (b) surface free energy (SFE) of PDMS-PUa with different DCOIT content.

Table S1 Mechanical properties and repairing efficiency of PDMS-PUa/DCOIT

Sample	DCOIT content [wt%]	Repairing time [h]	Ultimate strength [MPa]	Elongation at break [%]	Repairing efficiency [%]
PDMS−PUa	0	original*	0.81±0.02	551±12	-
		24	0.33±0.01	539±8	41
		48	0.73±0.03	516±10	90
PDMS-PUa/1.0	1.0	original*	0.78±0.02	606±11	-
		24	0.34±0.03	567±14	44
		48	0.71±0.01	568±9	91
PDMS-PUa/2.5	2.5	original*	0.64±0.04	652±12	-
		24	0.31±0.01	625±15	48
		48	0.60±0.02	618±13	94
PDMS-PUa/5.0	5.0	original*	0.44±0.03	702±11	-
		24	0.24±0.02	685±8	55
		48	0.43±0.03	661±14	98
PDMS-PUa/10.0	10.0	original*	0.22±0.01	803±10	-
		24	0.20±0.02	761±8	91
		48	0.22±0.03	773±12	100

*The undamaged sample.