

Electronic Supplementary Information

Robust superhydrophobic polyurethane sponge as highly reusable oil-absorption material

Qing Zhu, Ying Chu, Zhikui Wang, Ning Chen, Li Lin, Fatang Liu, Qinmin Pan*

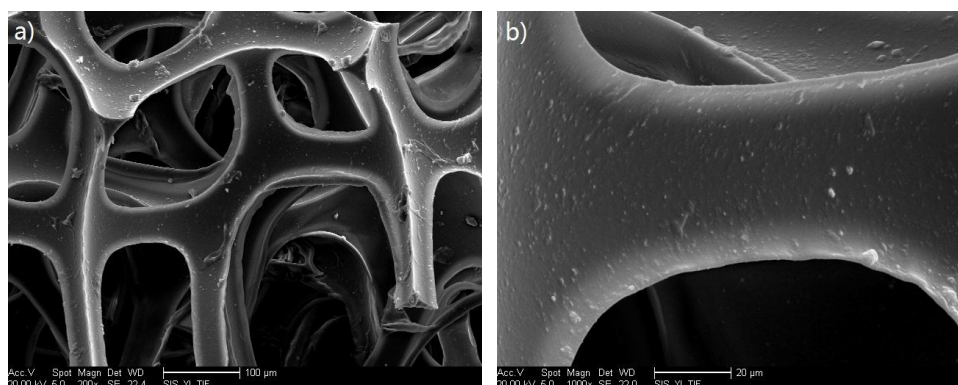


Fig. S1. SEM images of the pristine sponge.

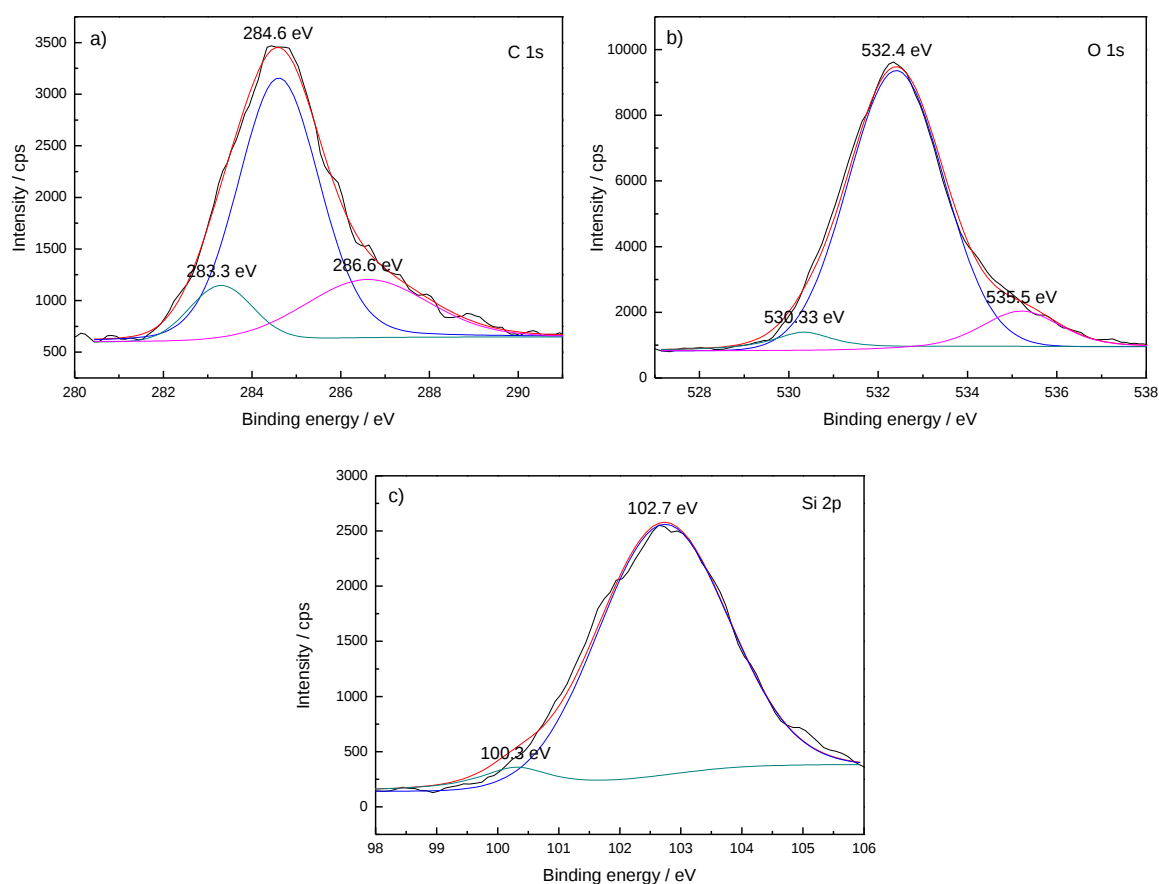


Fig. S2. C 1s, O 1s and Si 2p spectra of the superhydrophobic sponges.

In XPS spectra, the peaks at 102.7 eV in Si 2p and 530.33 eV in O 1s also confirmed the presence of Si-O-Si

bond of polysiloxane, and peaks at 283.3 eV in C 1s and 100.3 eV in Si 2p attributed to Si-C.¹⁻³ The signals of C-O, C-C could be found at 286.6 eV in C 1s, 532.4 eV in O 1s and 284.6 eV in C 1s, respectively.^{4, 5}

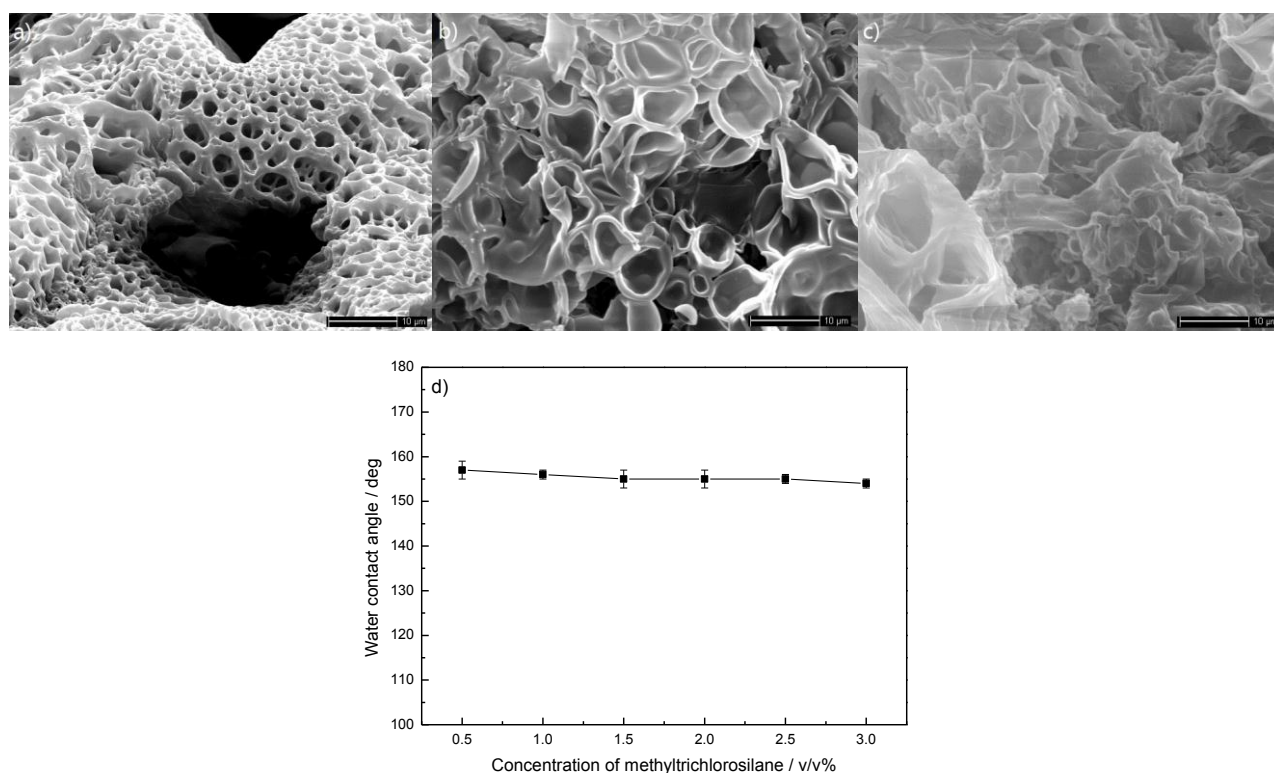
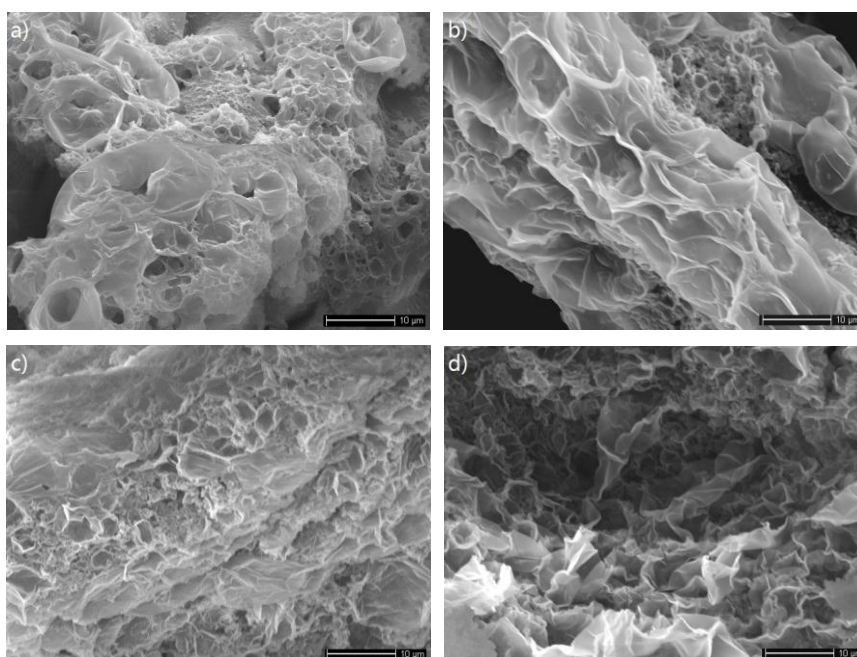


Fig. S3. SEM images (a-c) and water contact angle measurements (d) of the sponges treated with (a) 1.5%, (b) 2% and (c) 3% (v/v) methyltrichlorosilane/hexane solutions under RH = 30%.



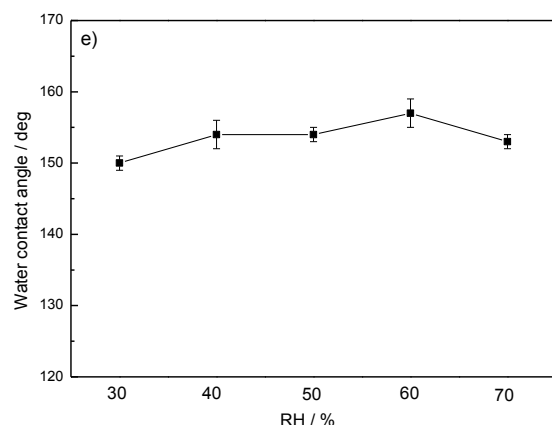


Fig. S4. SEM images (a-d) and water contact angle measurements (e) of the sponges treated in 0.5% (v/v) methyltrichlorosilane/hexane solution in the atmosphere with RH = 40% (a), 50% (b), (c) 60%, (d) 70%.

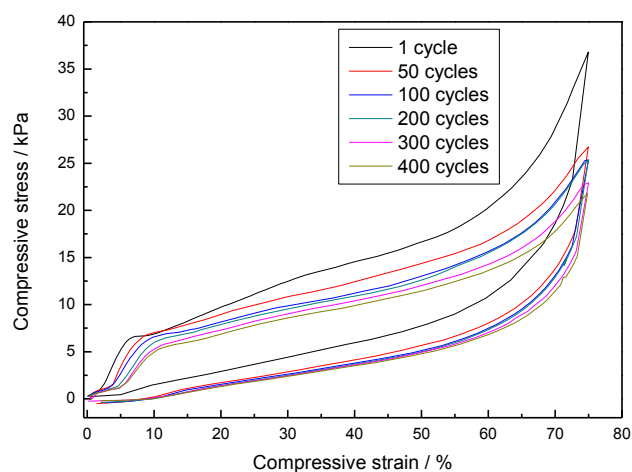


Fig. S5. Stress-strain curves of the pristine sponge in the process of mechanical compression for 400 cycles.

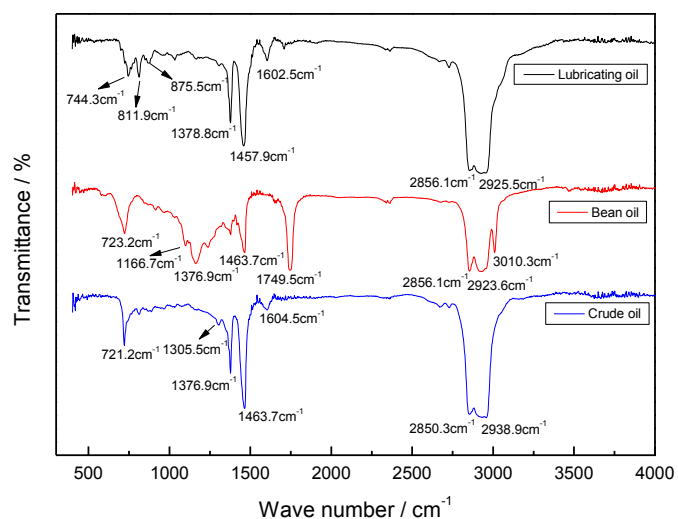


Fig. S6. FT-IR spectra of the oils collected from the superhydrophobic sponges through mechanical squeezing.

References

- (1) D. C. Lim, Y. J. Lee, D. J. Choi, *Surface and Coating Technology* 2005, **192**, 247.
- (2) C. G. Spanos, S. J. Ebbens, J. P. S. Badyal, *Macromolecules* 2003, **36**, 368.
- (3) D. E. Rollings, J. G. C. Veinot, *Langmuir* 2008, **24**, 13653.
- (4) C. Zhou, V. K. Khlestkin, D. Braeken, K. D. Keersmaecker, W. Laureyn, Y. Engelborghs, G. Borghs, *Langmuir* 2005, **21**, 5988.
- (5) C. Satriano, E. Conte, G. Marletta, *Langmuir* 2001, 17, 2243.