Electronic Supplementary Material (ESI) for RSC Advances.


# Supporting Information

## Bio-inspired Writable Multifunctional Recycled Paper with Out- and in- Side Uniform Superhydrophobicity

Yifan Si,[a,b] and Zhiguang Guo,[a,b*]

*a. Hubei Collaborative Innovation Centre for Advanced Organic Chemical Materials and Ministry of Education Key Laboratory for the Green Preparation and Application of Functional Materials, Hubei University, Wuhan, People's Republic of China.*
*b. State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, People's Republic of China.*
**Corresponding author. Tel: 0086-931-4968105; Fax: 0086-931-8277088. Email address: zguo@licp.cas.cn (Guo)*

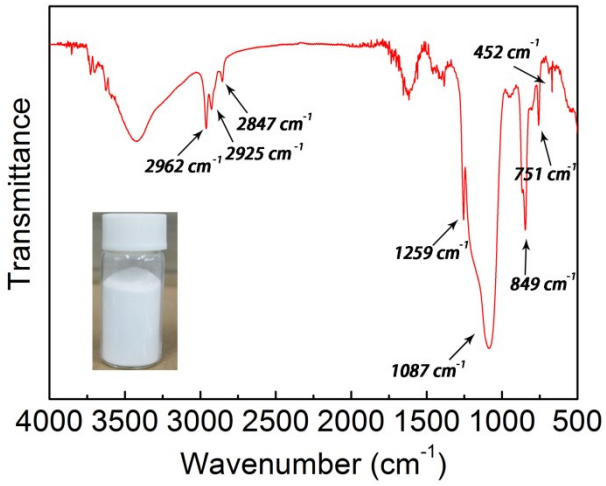


**Fig. S1** FTIR spectra of the SSGP. The insets: Optical images of SSGP.

Si-$(CH_3)_3$ related at 2962 $cm^{-1}$ (C-H), 1259 $cm^{-1}$ (Si-C) and 751 $cm^{-1}$ (C-H). The band at 1087 $cm^{-1}$, 849 $cm^{-1}$ and 452 $cm^{-1}$ are related to the Si-O-Si. The absorptions band at 2925 $cm^{-1}$ and 2847 $cm^{-1}$ are assigned to the vibrations of $-CH_2$ and $-CH_3$ groups.

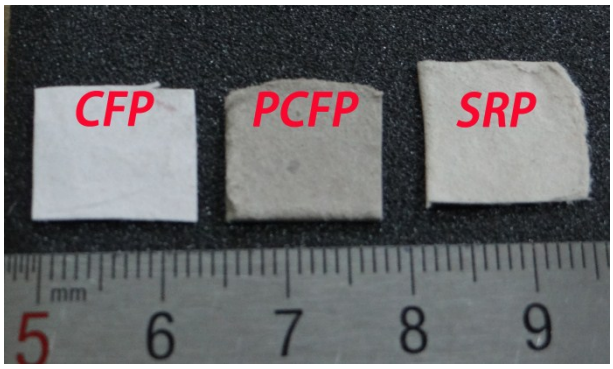


**Fig. S2** Optical images of CFP, PCFP and SRP.

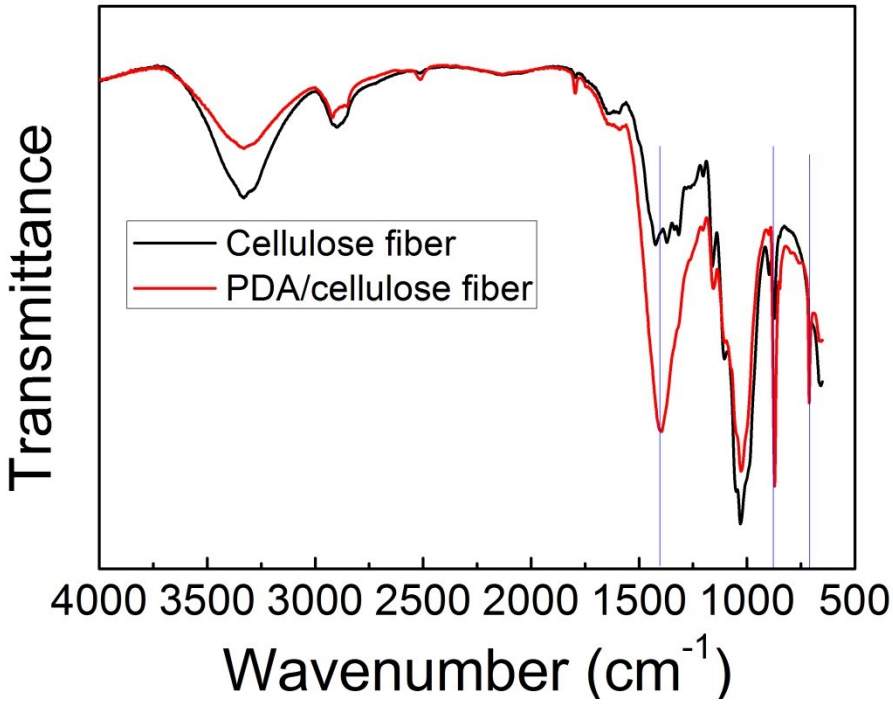


**Fig. S3** FTIR spectra of cellulose fiber and PDA/cellulose fiber.

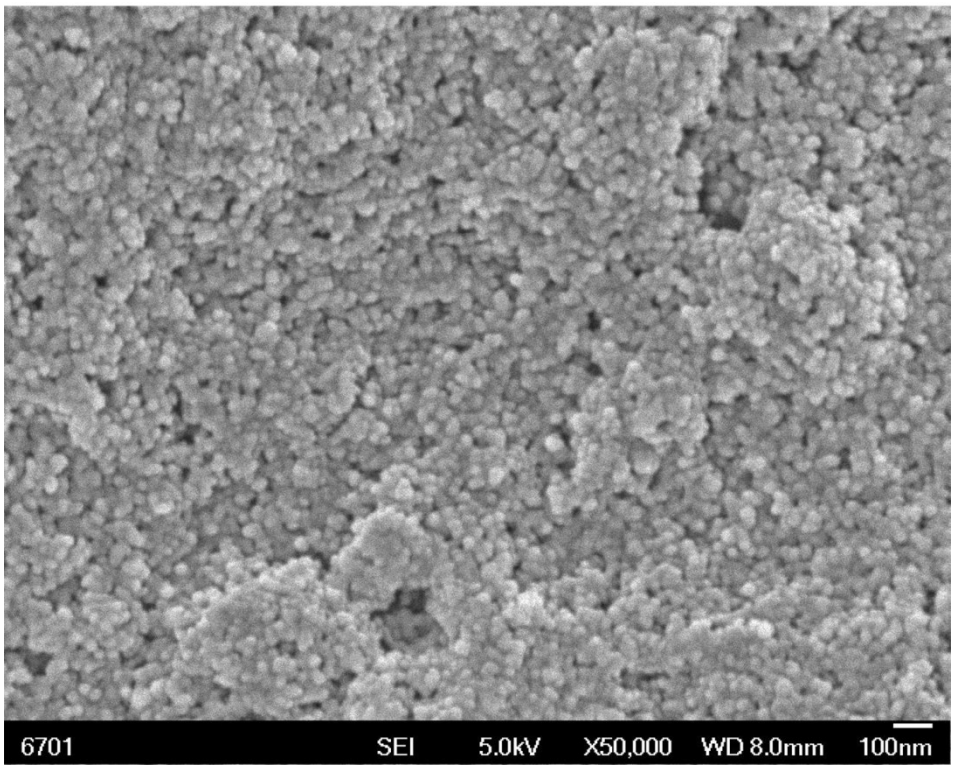


**Fig. S4** High resolution FESEM images of SSGP.

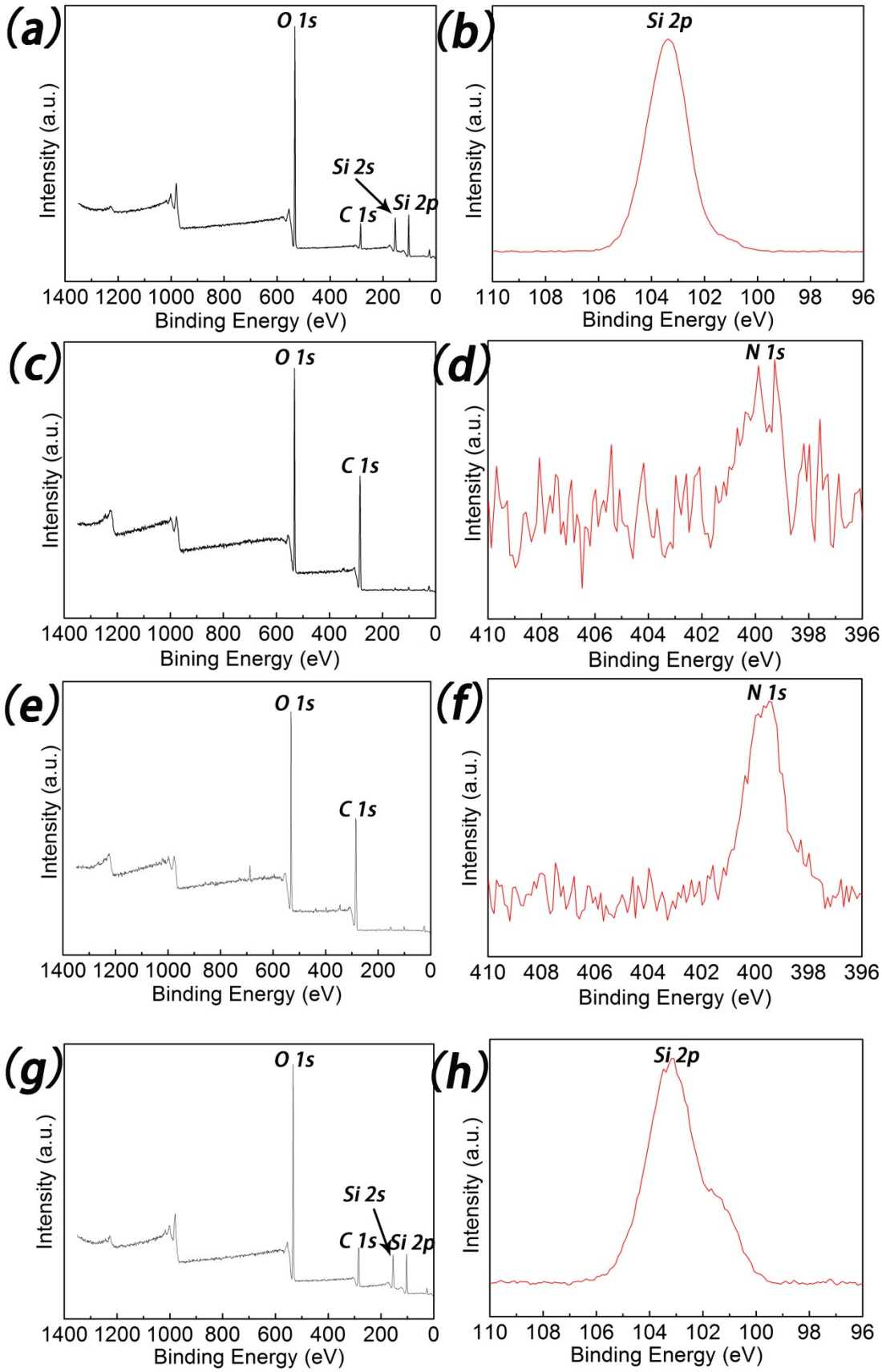


**Fig. S5** (a, b) XPS spectra and Si 2p spectra of SSGP. (c, d) XPS spectra and N 1s of CFP. (e, f) XPS spectra and N 1s PCFP. (g, h) XPS spectra and N Si 2p of SRP.

**Fig. S6** The photographs of water droplet CA of PCFP.

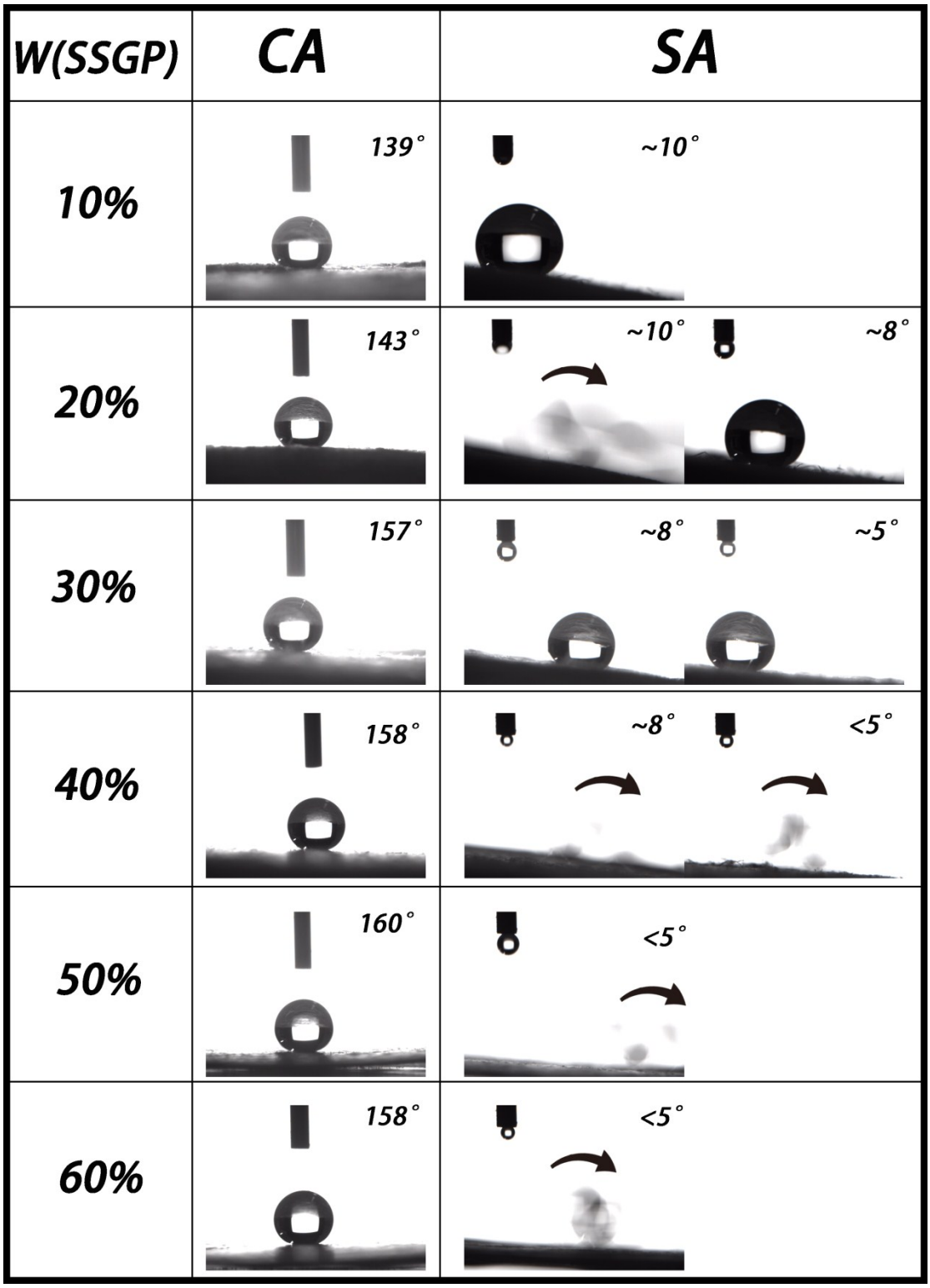


**Fig. S7** The photographs of CAs and SAs of SSGP/DPA/cellulose papers with different W(SSGP) from 10% to 60%.

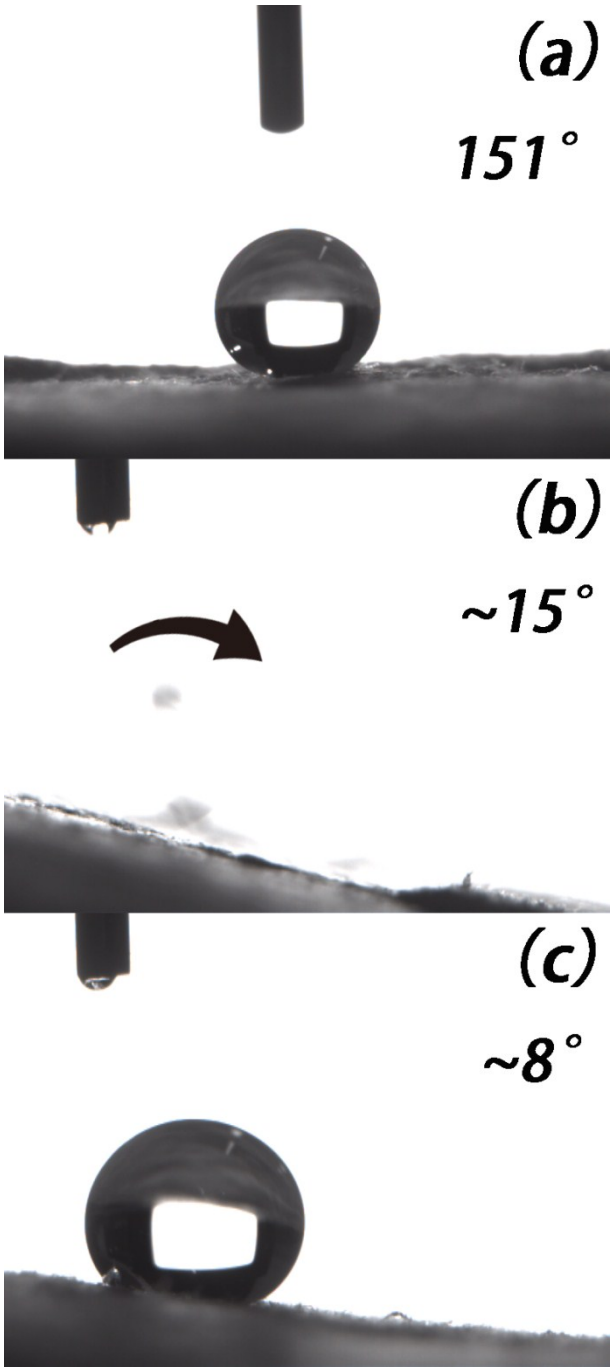


**Fig. S8** The photographs of CA and SAs of SSGP/cellulose paper with W(SSGP) = 40%.

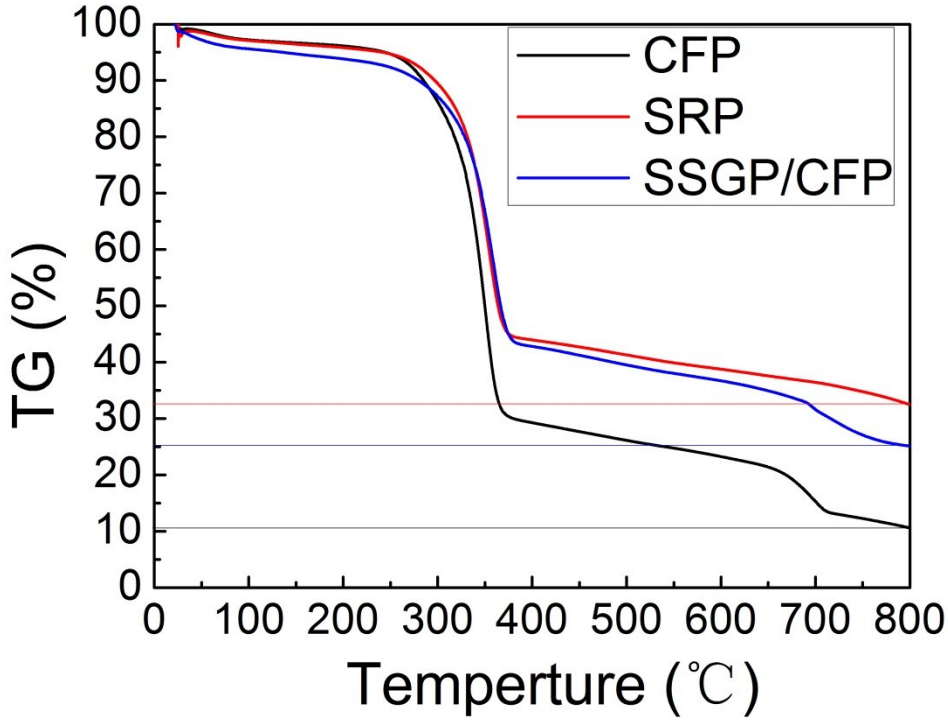


**Fig. S9** TGA of CFP, SSGP/CFP and SRP.

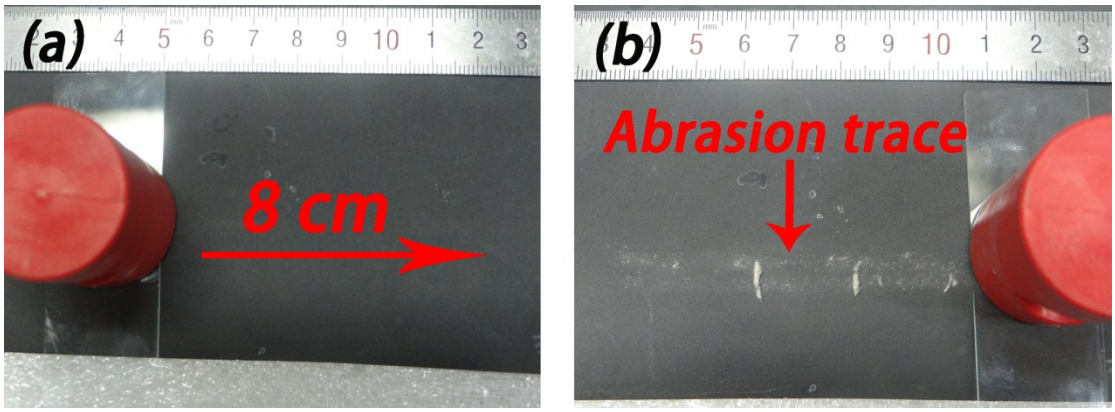


**Fig. S10** (a, b) Photograph of one cycle experiment of the sandpaper abrasion.