Supporting Information

Organic Solvent-Free Fabrication of Durable and Multifunctional Superhydrophobic Paper from Waterborne Fluorinated Cellulose Nanofiber Building Blocks

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Video No.	Description
Video S1	Jet motion of water on coated glass (extent of water repellency test)
Video S2	Droplet dragged test (water pinning test)
Video S3	Vertical drop adhesion test (water pinning test)
Video S4	Knife scratch test
Video S5	Peel-off test
Video S6	Sand paper abrasion test with a load of 50 g
Video S7	Finger wiping test
Video S8	Water on abraded waterproof paper
Video S9	Self-cleaning property
Video S10	Effect of organic solvents

Video S11	Integrity test: Stability of waterproof paper in water
Video S12	Extent of water repelling nature of waterproof paper, ink diffusion test



Figure S1. AFM image (2D & 3D view) of unmodified cellulose nanofibers (coated on glass).



Figure S2. Droplet pinning test: Dragged water droplet (~ 2μ L). Droplet moved back and forth 5 cm on coated surface without any sign of pinning.



Figure S3. Vertical drop test. Volume of water drop ~ 2 μ L.



Figure S4. Tackiness measurement. Both native and modified CNF show water-like nature. Concentrations of CNF in both the cases were the same.



Figure S5. Mechanical strength of modified cellulose nanofiber composed waterproof paper (without any adhesive). This is compared with the unmodified cellulose nanofiber paper.



Figure S6. SEM images of the unmodified cellulose in different magnifications at a tilt of 45°. Fibrous nature of the surface is lear in the images.



CNF (coated on glass). The values determined at 500 μ N peak load are shown in the Table. The E_r and H values corresponding to 500 μ N can be considered as representative bulk values obtained using equations (i) and (ii), respectively.



Figure S8. Deconvoluted XPS spectrum of C1s shows the presence of only cellulosic carbons. The reduced Young's modulus and hardness of the modified CNF.



Figure S9. Deconvoluted XPS spectrum of F1s of the modified CNF. Spectrum of the unmodified CNF is also shown.



Figure S10. Characterization of the native cellulose nanofiber. (A) TEM image and (B) AFM image of the sample.



Figure S11. Characterization of the supernatant of modified CNF dispersion. (A) IR spectra of supernatant, AS, FS, and water. (B) Expanded view of marked area in A. IR spectrum of supernatant (blue) does not contain any characteristic peak of AS (black) and FS (red). It is similar to pure water (orange).



Figure S12. Long term stability test of chemically attached FS and AS with CNF. (A) IR spectra of 'water after sonication', AS, FS, and water. (B) Expanded view of marked area in A. IR spectrum of 'water after sonication' (purple) does not contain any characteristic peak of AS (black) and FS (red). It is similar to pure water (orange).

Supporting videos are given separately.