

Supporting Information

One-step synthesis of mechanically robust, humidity-stable anti-reflective sub-micron coating with high transparency

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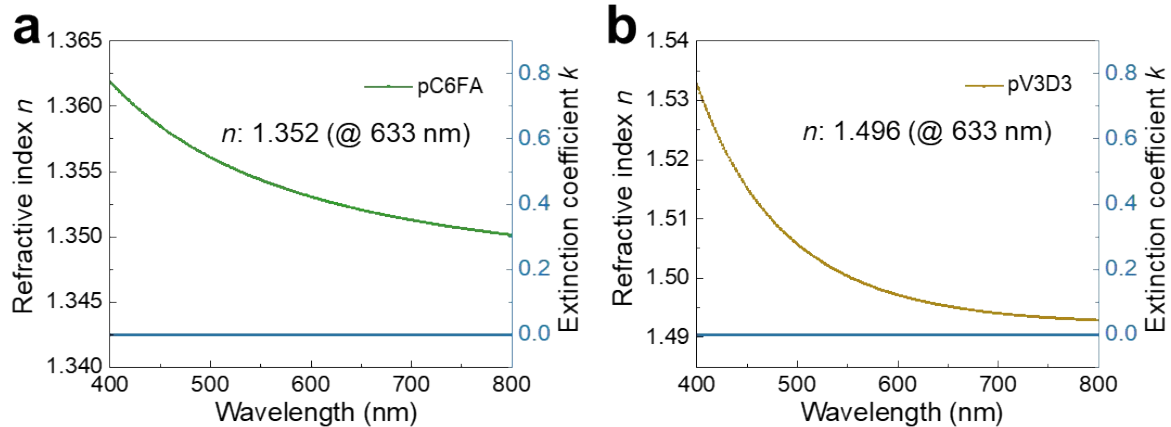


Fig. S1. Refractive index and extinction coefficient of pC6FA(a) and pV3D3(b).

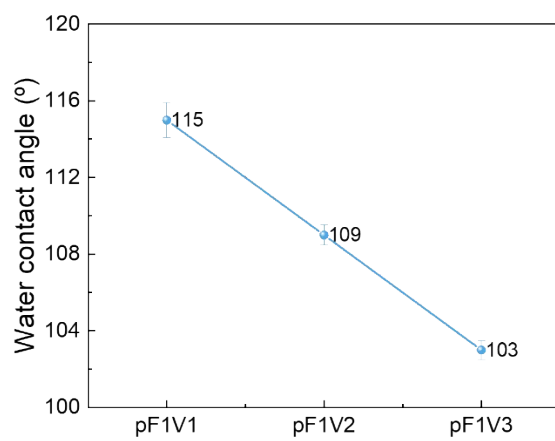


Fig. S2. Water contact angle of pFV copolymers.

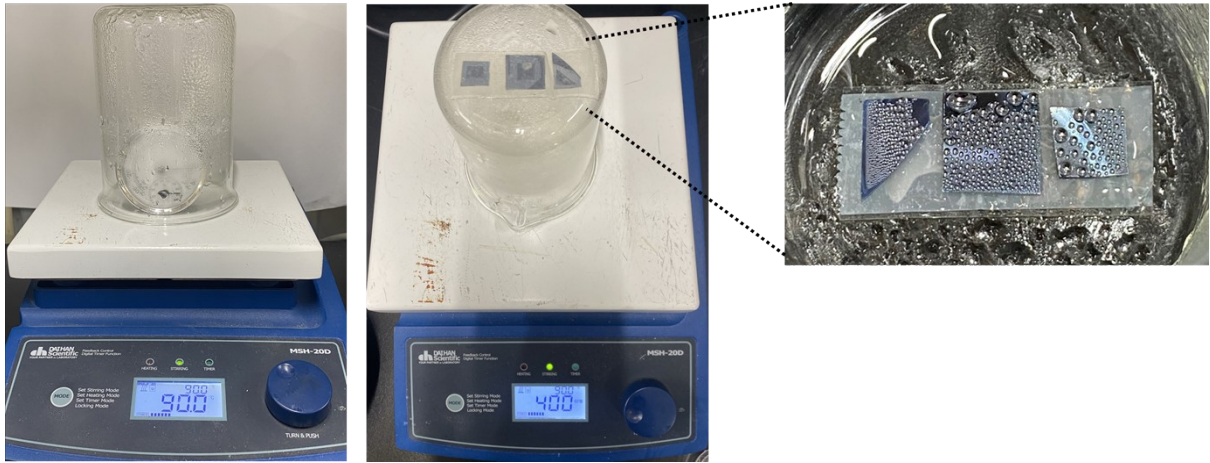


Fig. S3. Experimental setup for humidity environment test.

Table S1. iCVD process conditions for pFV series

Polymer	Flow rate (sccm)			Chamber pressure (mTorr)	Filament temperature (°C)	Substrate temperature (°C)
	C6FA	V3D3	Initiator			
pF1V1	0.440	0.432	0.440	100	140	30
pF1V2	0.440	1.441	0.440	100	140	30
pF1V3	0.440	2.190	0.440	200	140	30

Table S2. Surface composition ratios of pFV series via XPS analysis

Polymer	Atomic ratio (%)				Monomer feed ratio (C6FA:V3D3)	Copolymer ratio (C6FA:V3D3)
	C1s	O1s	F1s	Si2p		
pF1V1	40.2	6.81	52.85	0.15	1:1	1:0.01
pF1V2	41.28	6.91	51.62	0.19	1:3	1:0.02
pF1V3	43.01	8.37	47.7	0.92	1:5	1:0.08

Table S3. Change in thickness and refractive index of pF1V3 under water immersion

Immersion time	Initial	12 hr	24 hr	36 hr	48 hr
Thickness (nm)	598	602	602	603	603
Refractive index ($n @ 632.8 \text{ nm}$)	1.3744	1.3740	1.3746	1.3740	1.3745

Table S4. Elemental composition of pFV deposited on PET film via EDS analysis

Element	Atomic %
C	65.21
O	21.78
Si	0.21
F	12.80

Table S5. Change in transmittance after cyclic bending test

Bending cycles	Initial	100	1,000	5,000	10,000
Transmittance (@ 633 nm)	99.8	99.8	99.6	98.4	98.4