Supporting information materials

"Thiol-ene" photo-curable hybrid fluoridated resist for the high-performance replica molding of nanoimprint lithography (NIL)

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Table S1. Swelling ratio (Qr) of the JTHC-b resists

	Solvent	Swelling ratio (wt%)	
		POSS-SH/$DCFA_4$ (1:8)	POSS-SH/$DCFA_4$ (1:16)
1	Methanol	2.5	0.9
2	Ethanol	1.9	0.6
3	n-Hexane	1.0	0.6
4	Toluene	5.6	1.7
5	n-butyl acrylate	3.4	2.9

The swelling ratio of the fully cured fluoridated mixtures was calculated according to following equation: $Qr = 100\% \times (Ws-Wd)/Wd$. Here, W_s and W_d are the weights of the swollen samples for 24 h at 25^{o}C in solution media and the dried sample for 24 h in vacuum dedicator, respectively.

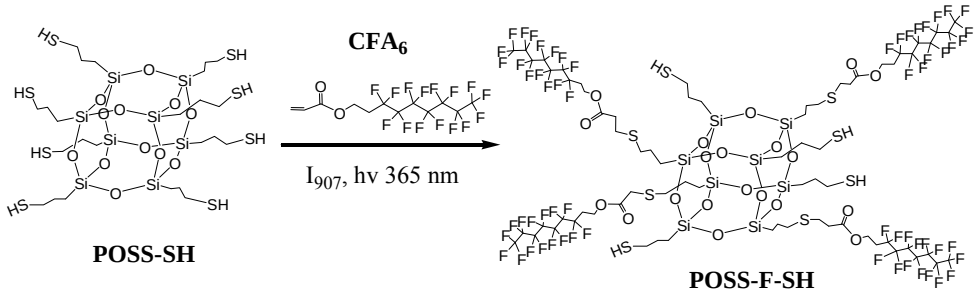

Figure S1. Synthesis of POSS-F-SH

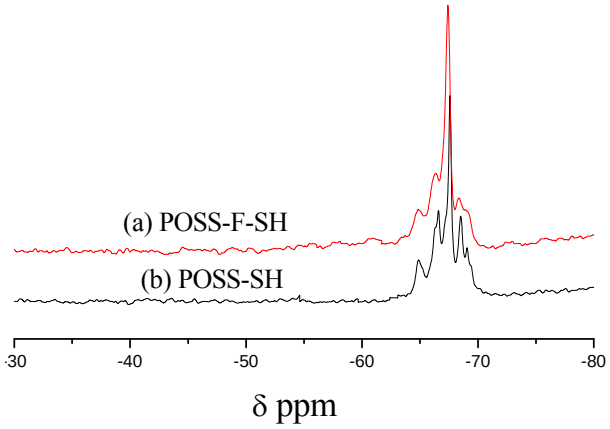

Figure S2. ^{29}Si NMR of (a) POSS-F-SH and (b) POSS-SH in $CDCl_3$: ^{29}Si NMR (d, ppm, $CDCl_3$): -67.47(s).

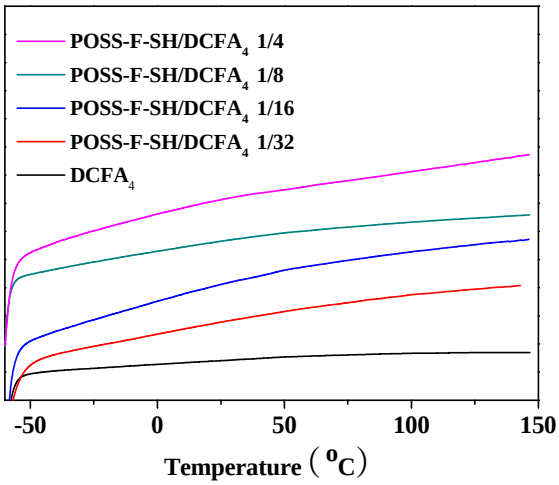

Figure S3. DSC curves of the $DCFA_4$ film and their hybrid films containing

POSS-F-SH.

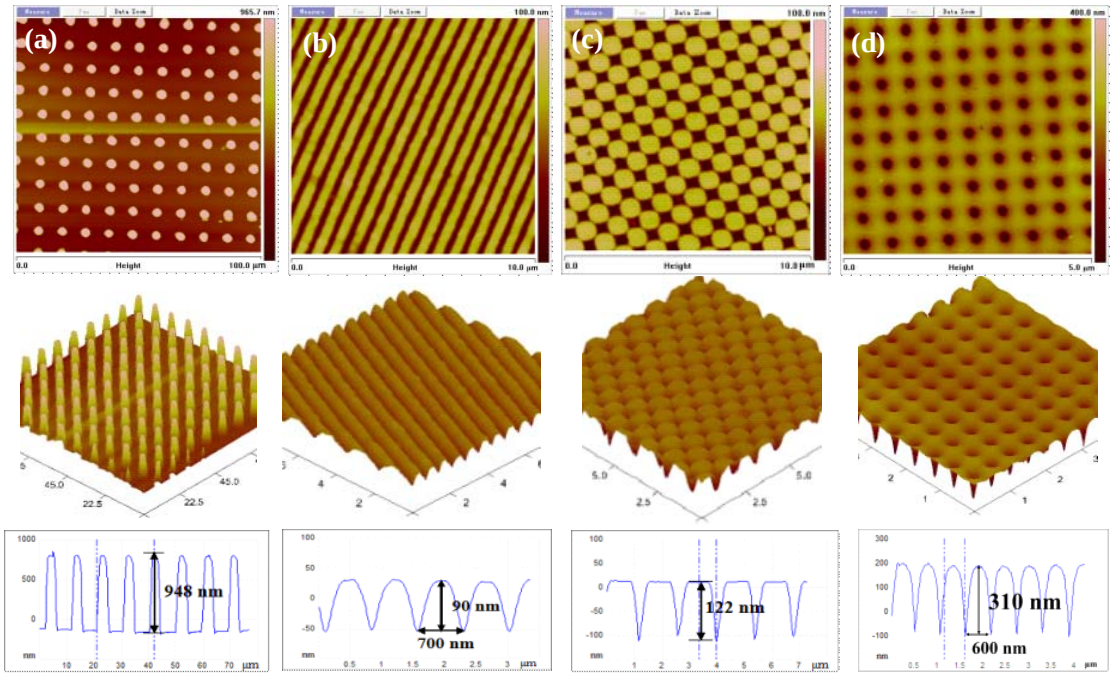

Figure S4. The perspective AFM and sectional profile images of NIL JTHC-b1 resist with different feature sizes: (a) 3.0 μm lattice, (b) 350 nm grating, (c) 700 nm lattice and (d) 200 nm lattice.

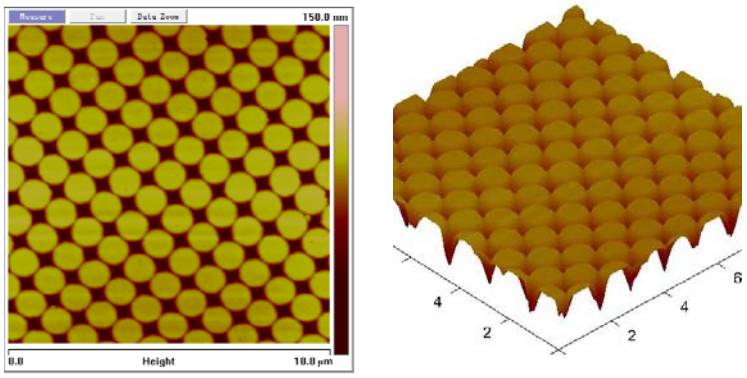

Figure S5. The perspective AFM and sectional profile images of the replica F-Mold after repeated UV-NIL for 10 times.