Electronic Supplementary Material (ESI) for RSC Advances.
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Supplementary information

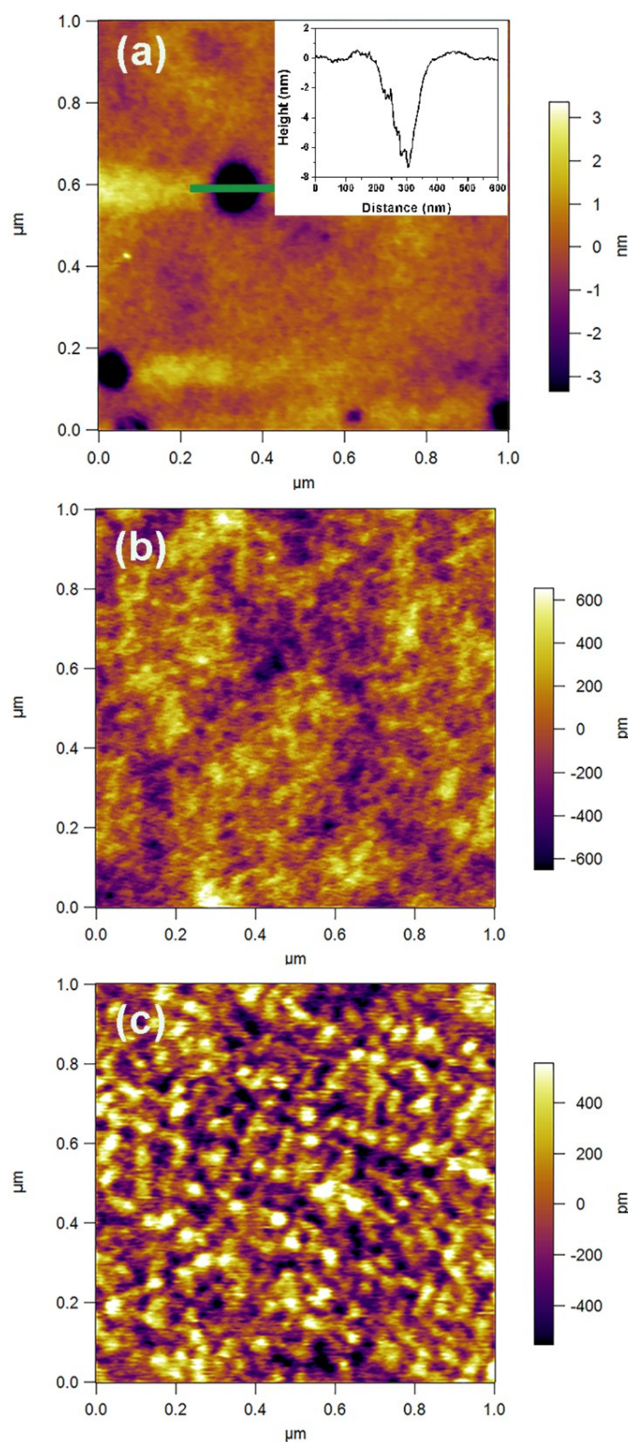

Figure S1. AFM images of (a) ~43 nm thick PMMA, (b) ~60 nm thick PVP, (c) ~32 nm thick C_4F_8 grown on Si (100) revealing their surface morphology, inset of (a): AFM height profile across the pin hole observed in Fig. S1(a).

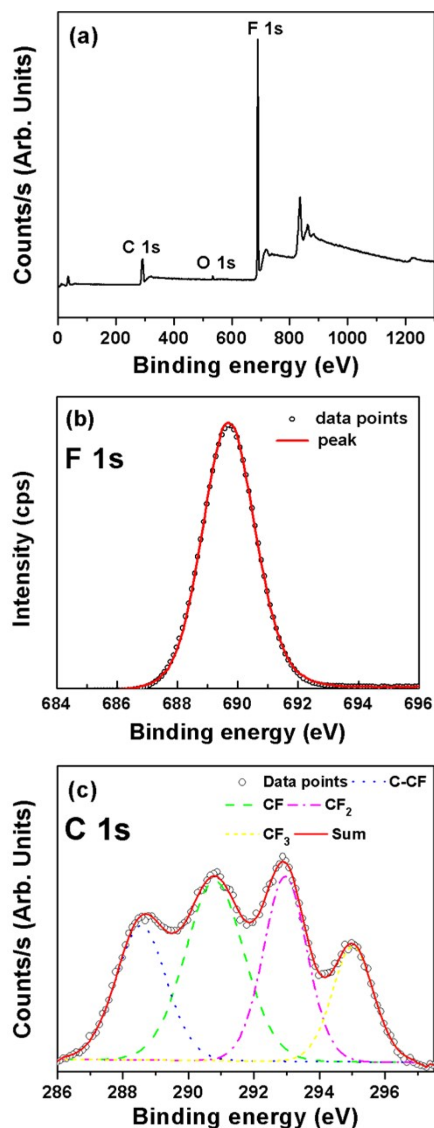

Figure S2. (a) XPS survey scan obtained from a ~32 nm thick plasma polymerized C_4F_8 thin film deposited on Si(100). High resolution XPS scans of (b) F 1s and (c) C 1s obtained from the same film.

Elemental composition and chemical bonding states of plasma polymerized C_4F_8 layer deposited on Si (100) were investigated by XPS. The spectrum of XPS survey scan and high resolution scans of fluorine and carbon are presented in Fig. S2. Survey scan (Fig. S2a) revealed the presence of F 1s, C 1s, and O 1s peaks having relative atomic concentrations of 54.51 %, 43.91 %, and 1.57 %, respectively. The fluorine to carbon ration (F/C) is found to be 1.24. Chemical bonding states in the polymer film were studied by the evaluation of F 1s and C 1s HR-XPS scans and are presented in Fig. S2 (b) and (c). HR-XPS scan of

F 1s spectrum shows a single symmetric peak at 689.73 which corresponds to C-F covalent bond. HR-XPS scan of C 1s shows various bonding schemes which are assigned to different chemical states (Fig. S2c). C 1s HR-XPS spectra has been deconvoluted into four sub peaks, which are assigned to C-CF (288.50 eV), CF (290.77 eV), CF_2 (292.80 eV), and CF_3 (294.60 eV) components.[1]

References:

(1) Li, X.; Hua, X.; Ling, L.; Oehrlein, G. S.; Barela, M.; Anderson, H. M. Fluorocarbon-Based Plasma Etching of SiO: Comparison of C4F6/Ar and C4F8/Ar Discharges. *J. Vac. Sci. Technol. A* **2002**, *20*, 2052–2061.