

Supplemental Information

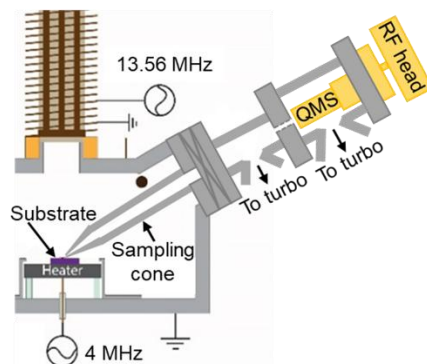


Fig. 1 Schematic of *in situ* QMS setup

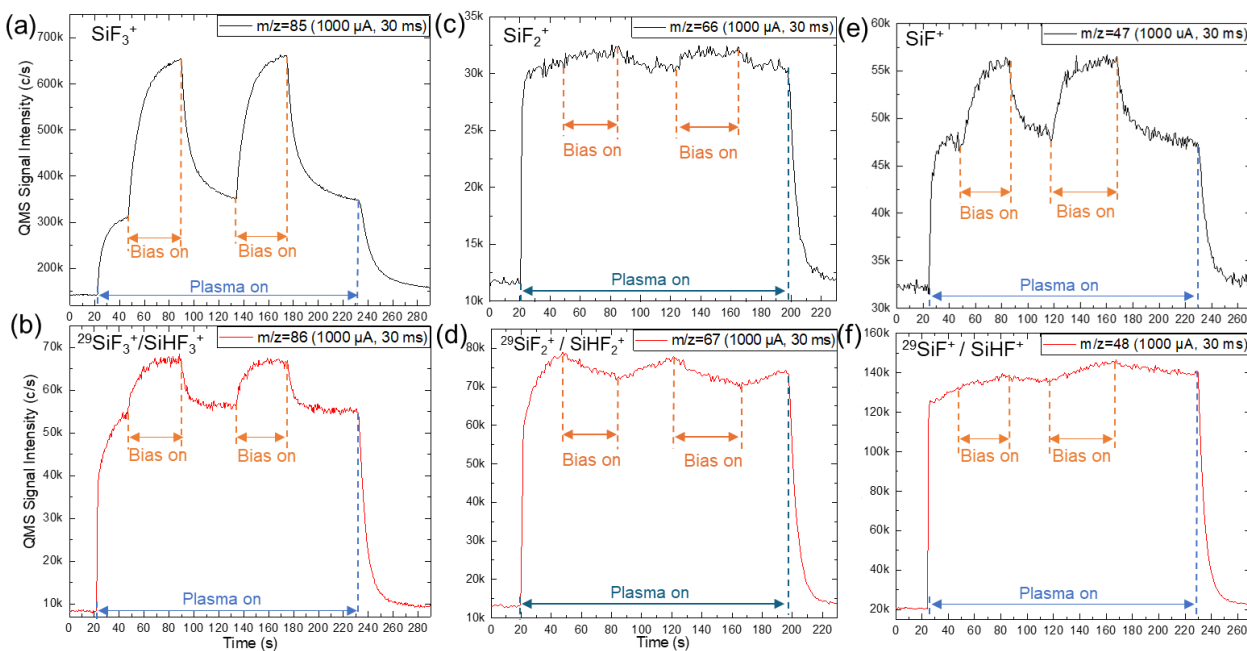


Fig. 2 Time-resolved mass spectra for SiF_x^+ ($x = 1, 2, 3$) and SiHF_x^+ ions during self-biased and applied-biased etching of SiN_x with HF plasma

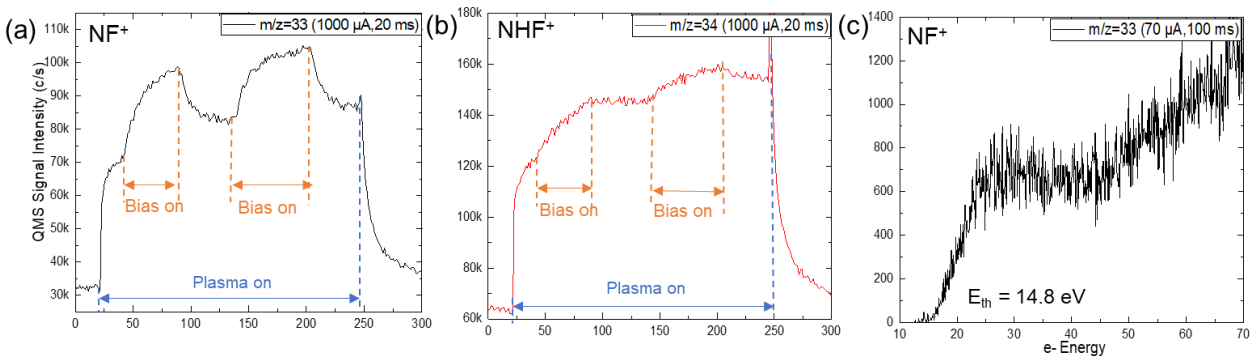


Fig. 3 Time-resolved mass spectra for (a) NF^+ and (b) NHF^+ ions; (c) electron energy scan of NF^+