Highly Precise Atomic Layer Etching of SiO_2 with SF_6 Radicals and TMA Surface Modification

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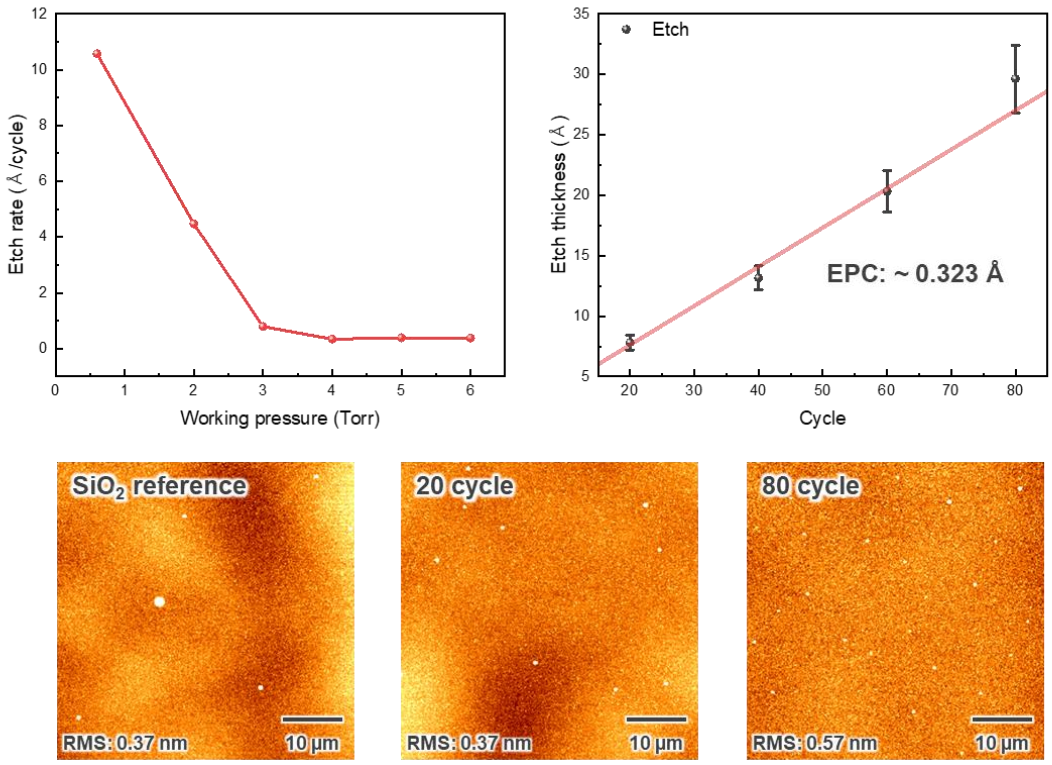

By fine-tuning the working pressure, it was observed that the etch rate saturated at below 1 Å per cycle when the pressure exceeded 3 Torr. Furthermore, atomic force microscopy (AFM) measurements over a 50 μm × 50 μm area revealed root mean square (RMS) surface roughness values of 0.37 nm for the reference sample, 0.37 nm after 20 cycles, and 0.57 nm after 80 cycles. The slight increase in RMS roughness with additional cycles correlates with the trend of increasing error bars in the etch depth measurements as the number of cycles progresses.

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