

## Supporting Information

### **Fabrication of High- $\kappa$ Dielectric Metal Oxide Films on Topographically Patterned Substrates: Polymer Brush Mediated Depositions**

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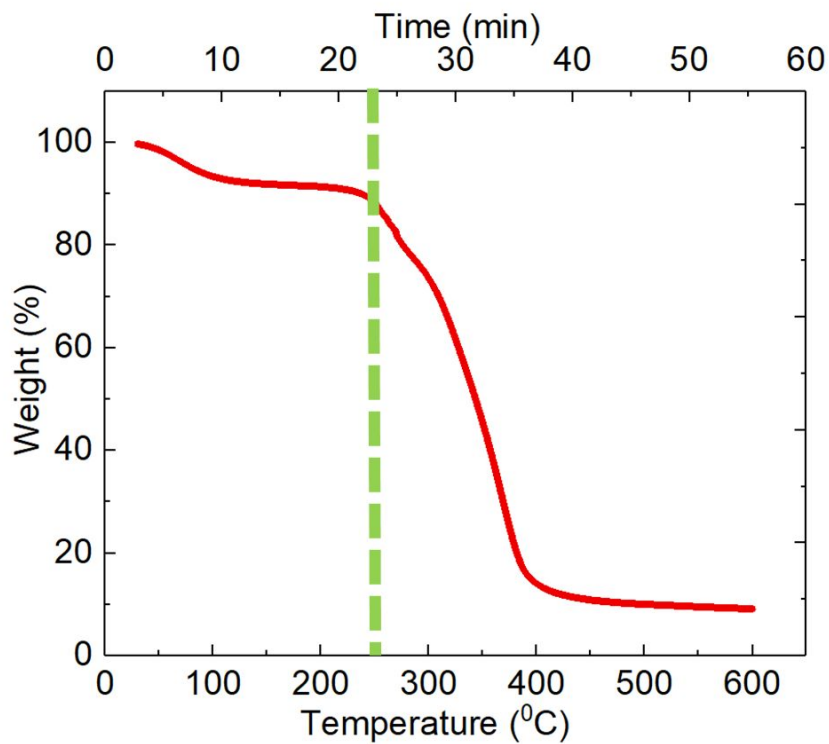
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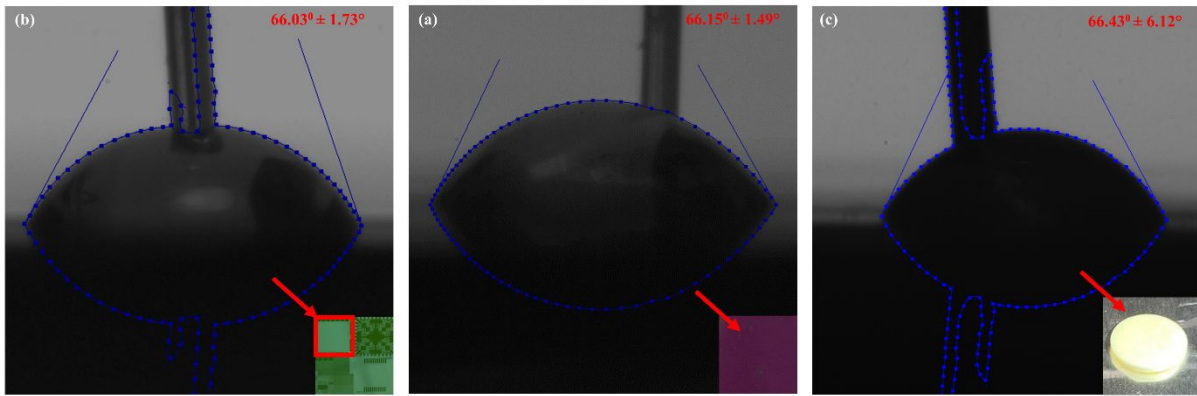
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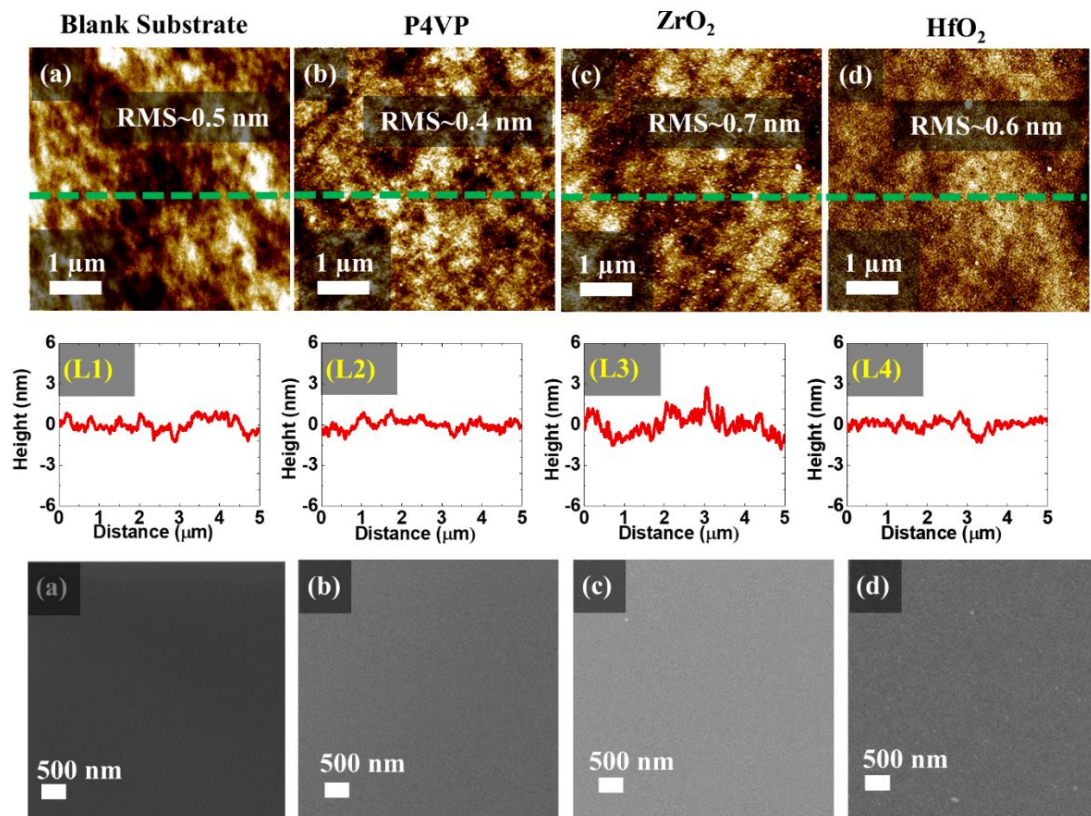
The upper threshold temperature for polymer brush grafting was determined using thermogravimetric analysis of powder P4VP-OH. We set a grafting temperature of 230 °C, to achieve complete monolayer coverage of the polymer brush.



**Figure S1** Thermogravimetric analysis was performed on the 5.5 kmol<sup>-1</sup> P4VP-OH at temperature range of 25-600°C for 60 minute. Polymer undergo thermal degradation at 250°C indicating optimum temperature for the grafting process.



**Figure S2** (a) water contact angle of grafted P4VP polymer brush measured at plane region of topographically patterned substrate of thick-coated P4VP film on plane silicon substrate (b) water contact angle of thick-coated P4VP film on plane silicon substrate (c) water contact angle of P4VP homopolymer pressed pellet using hydraulic pressure.



**Figure S3** AFM image of (a) as receive silicon native oxide substrate with line images at L1. (b) AFM and SEM images of P4VP polymer grafted silicon substrates with line images at L2 (c and d) are AFM and SEM images of oxidised  $ZrO_2$  and  $HfO_2$  samples with line images at L3 and L4