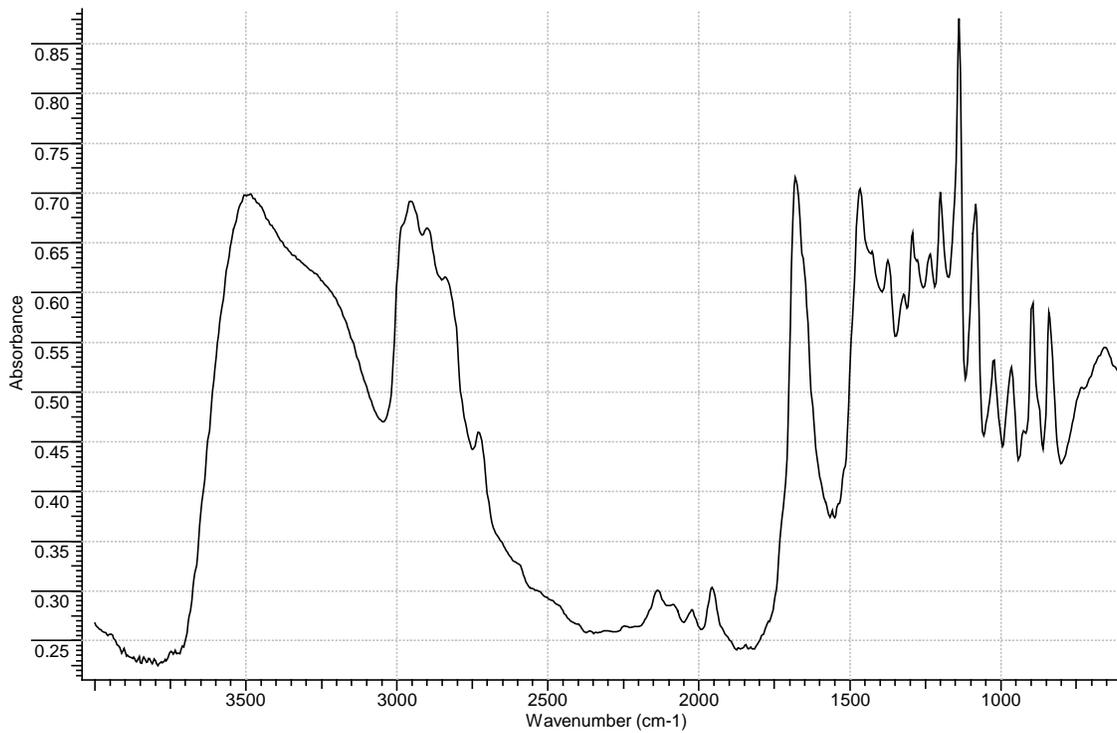
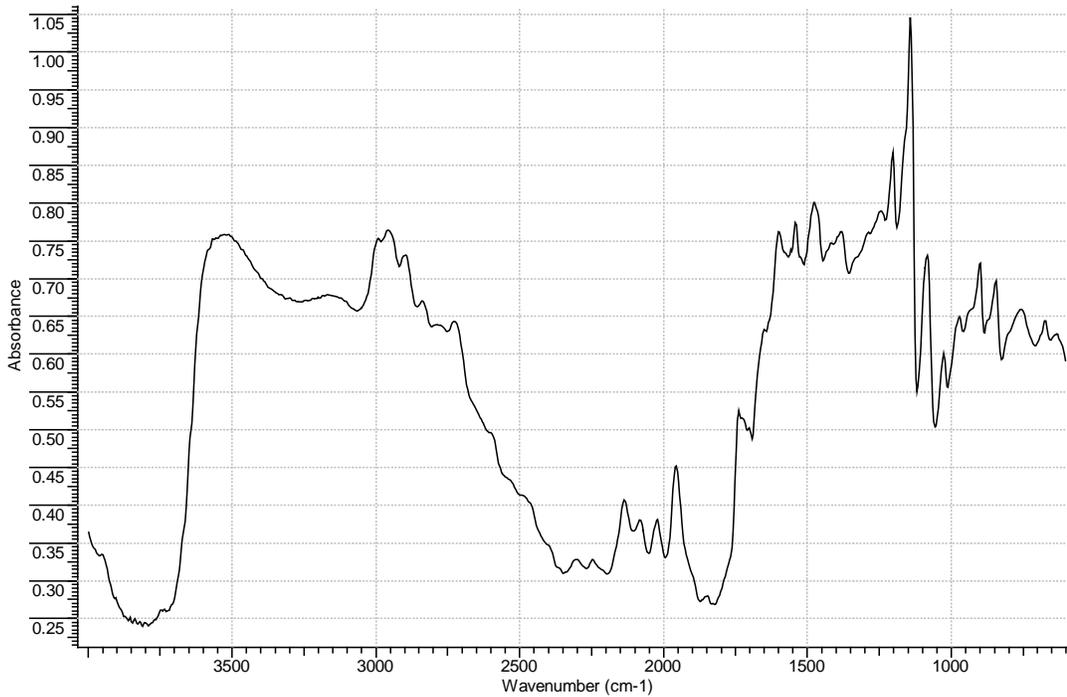


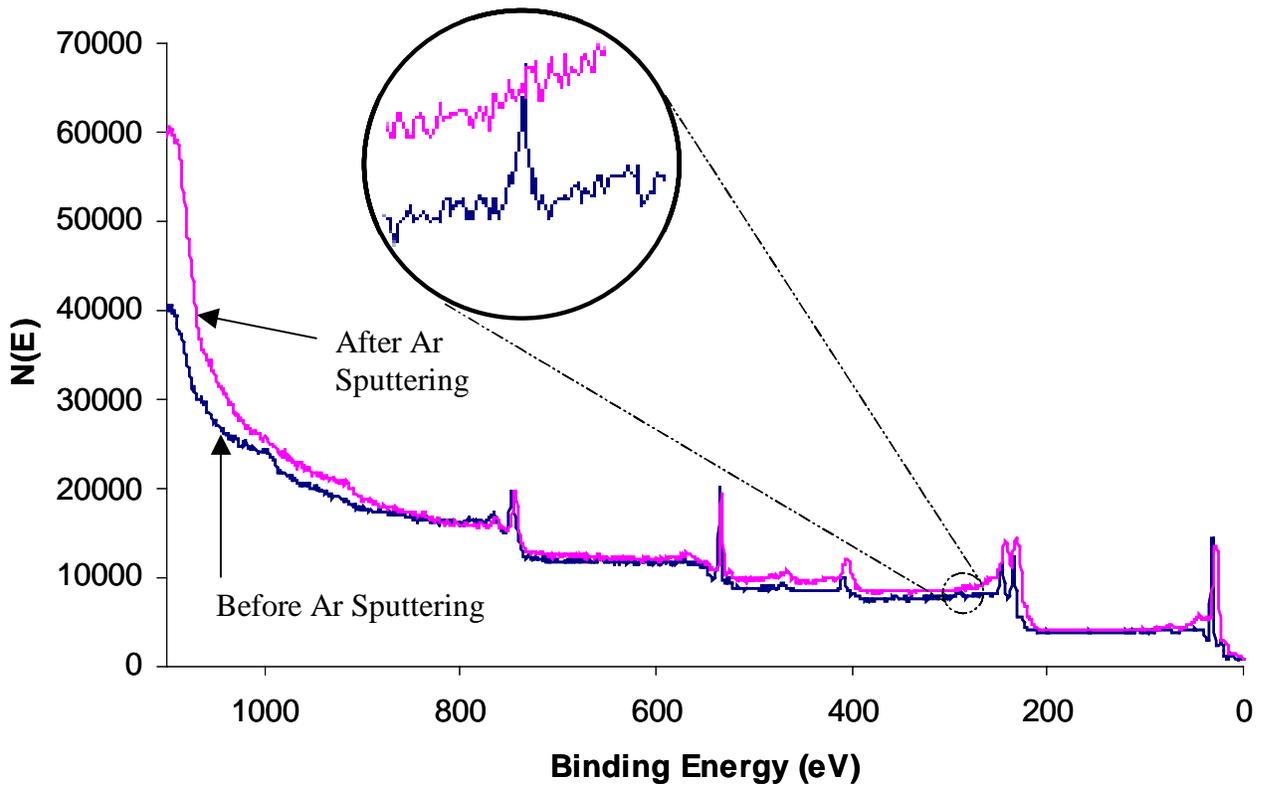
**Figure S1:** FTIR spectrum of 2-methoxyethanol film on Si<111>



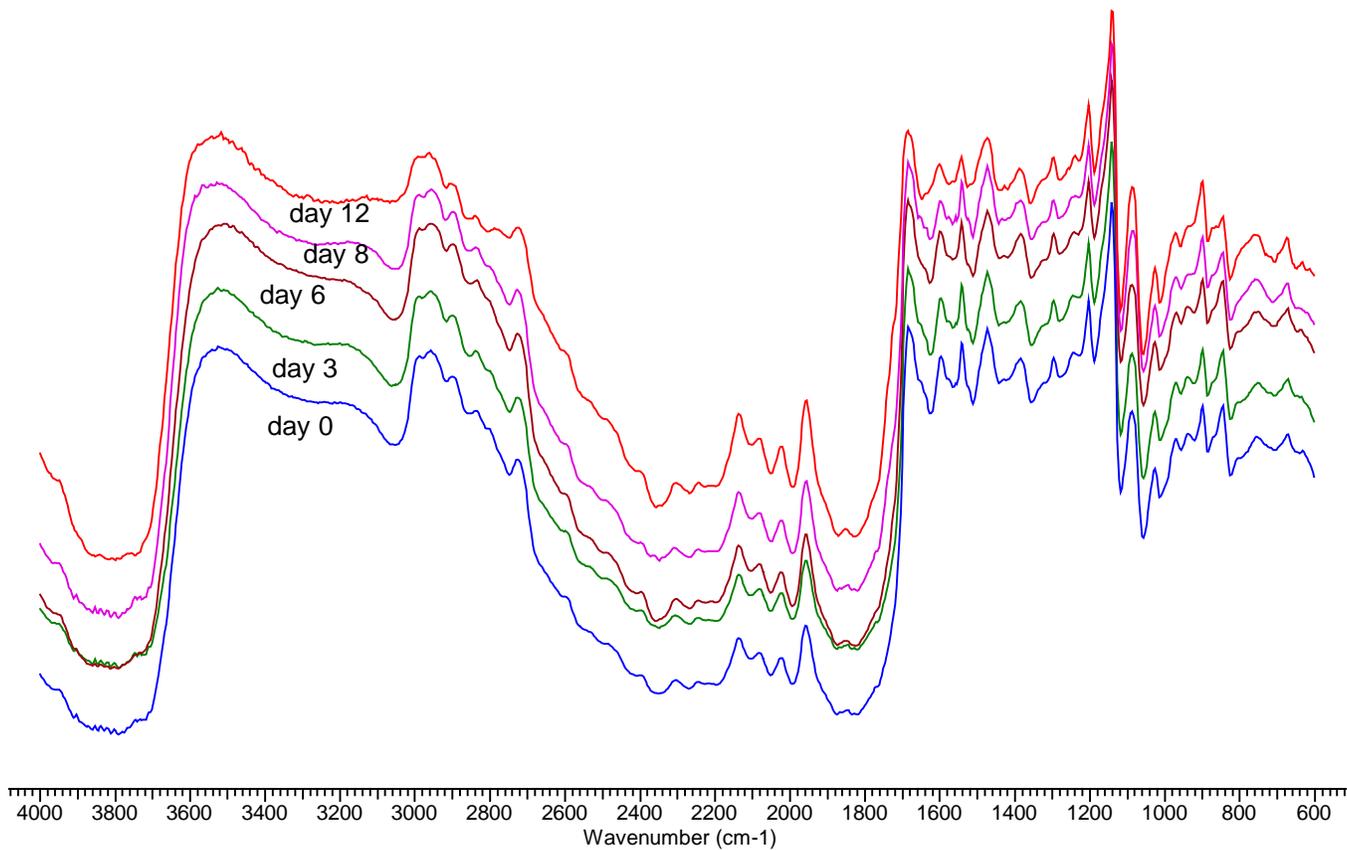
**Figure S2:** FTIR spectrum of PVP in 2-methoxyethanol film on Si<111>



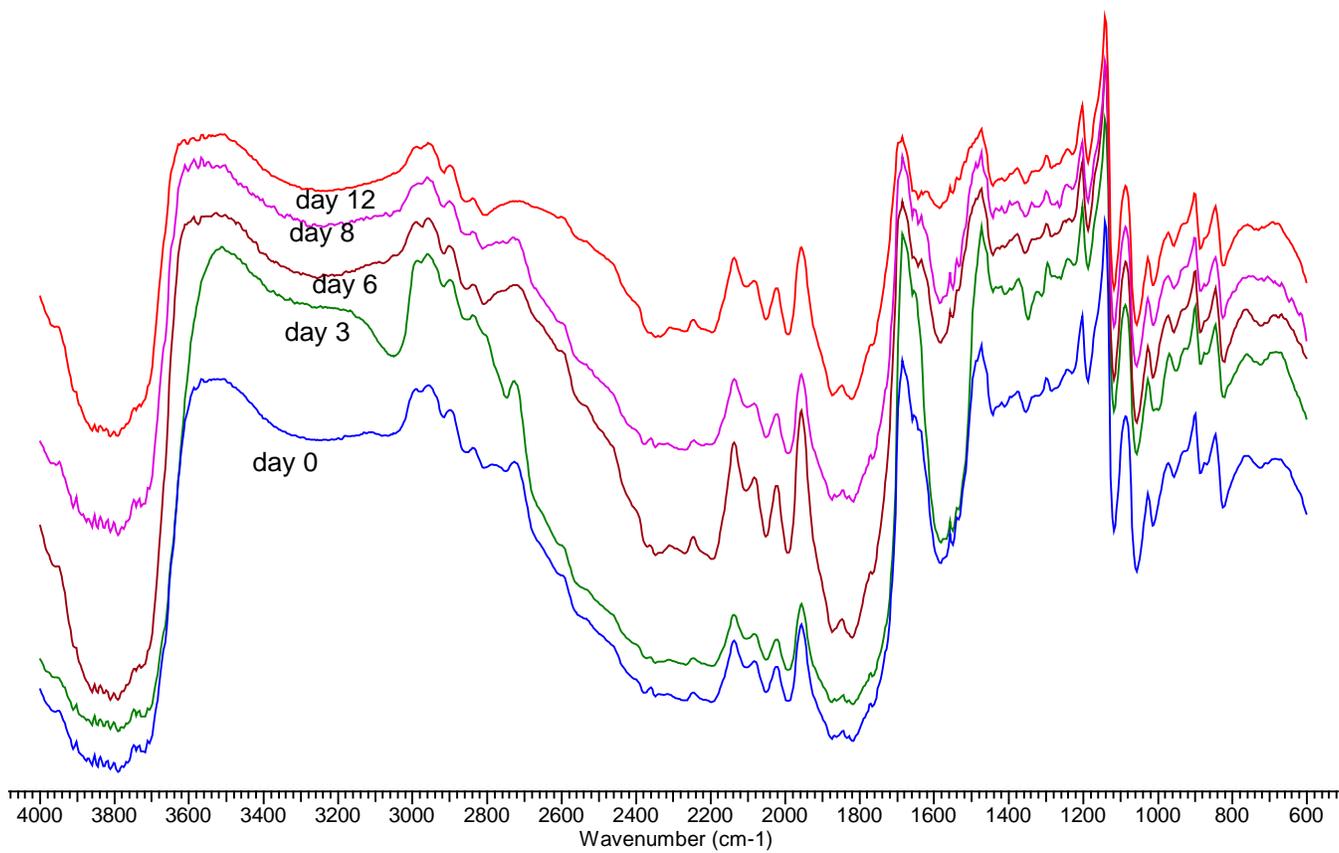
**Figure S3:** FTIR of control sol without PVP



**Figure S4:** XPS scan of  $\text{Ta}_2\text{O}_5$  film (calcined in  $\text{O}_2$  at  $900^\circ\text{C}$ ). [743eV: O  $\text{KL}_{23}\text{L}_{23}$ ; 531eV: O 1s; 401eV: Ta  $4p_{3/2}$ ; 285eV: C 1s (inset); 240eV: Ta  $4d_{3/2}$ ; 229eV: Ta  $4d_{5/2}$ ; 24eV: Ta  $4f_{5/2}$ ]



**Figure S5:** FTIR spectra of sol containing acetylacetonone



**Figure S6:** FTIR spectra of control sol (no acetylaceton)