

Fig. S1- XPS results recorded at 0.07 mbar O2 pressure and 673 K for Pd 3d5/2 core level, and the contribution from different states are deconvoluted. A distinct Pd 3d5/2 peak was observed at 336.5 eV is attributed to PdO. PdO is accompanied with metallic Pd and another feature at 335.0 and 335.7 eV, respectively. Latter feature is attributed to PdxOy or Pd with oxygen in the immediate subsurfaces.