

## †Electronic Supplementary Information (ESI)

### **Preparation and characterization of mesoporous Zr-WO<sub>x</sub>/SiO<sub>2</sub> catalysts for the esterification of 1-butanol with acetic acid**

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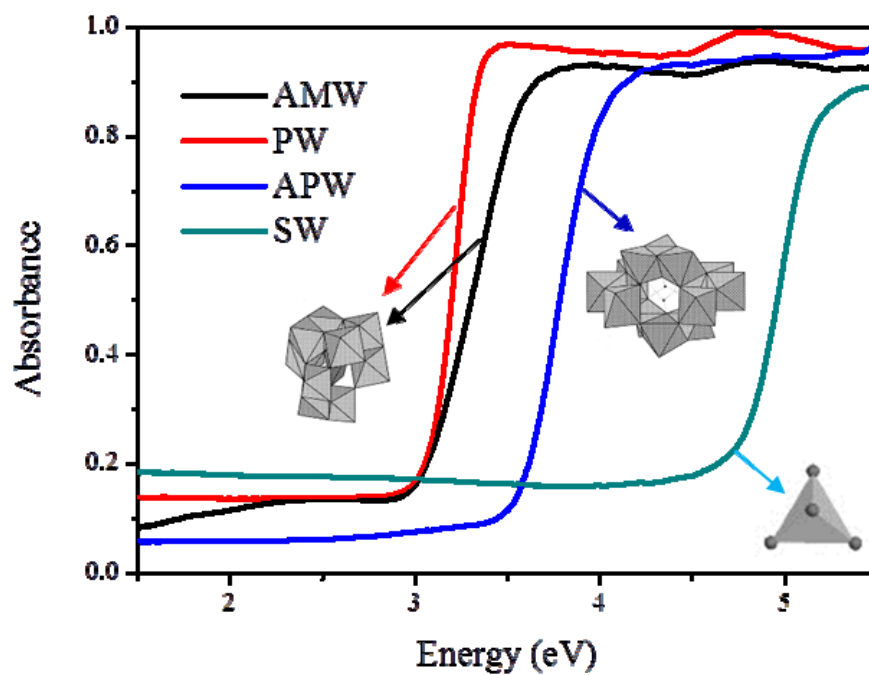


Fig. S1 UV-Vis spectra of model tungstate: Ammonium metatungstate (AMW), phosphotungstic acid (PW), ammonium paratungstate (APW), sodium tungstate (SW).

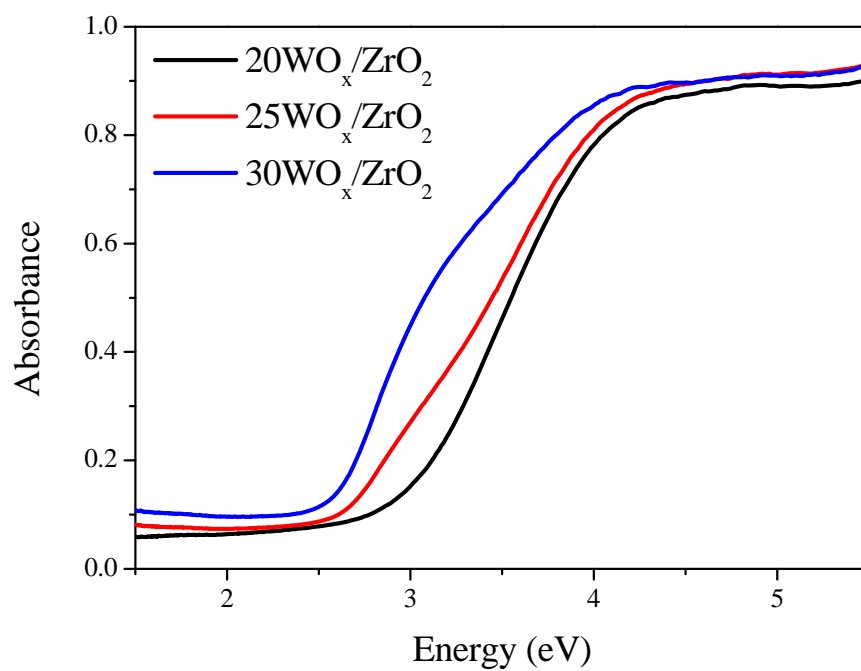


Fig. S2 UV-Vis spectra of supported WO<sub>x</sub>/ZrO<sub>2</sub> catalysts: Number denotes the wt% of WO<sub>x</sub>, calcined at 600oC

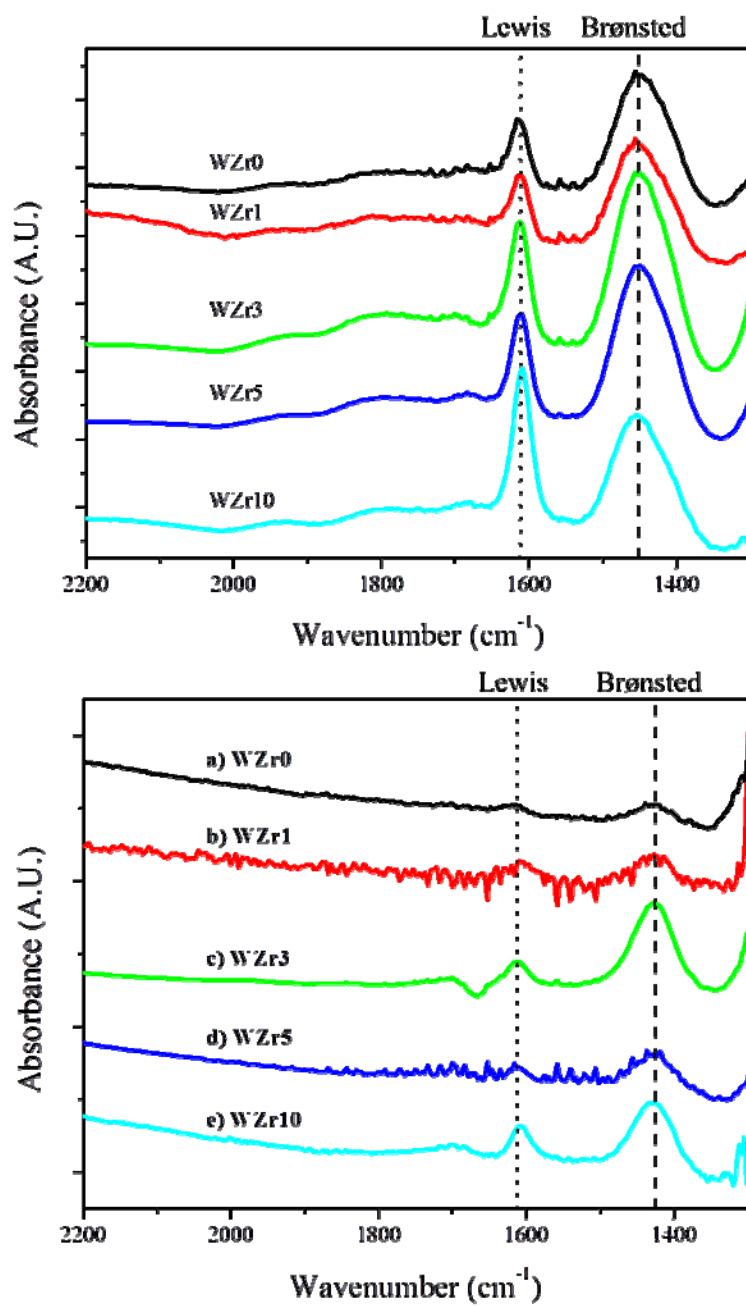


Fig. S3 NH<sub>3</sub> in-situ FTIR of WZrX catalysts: Evacuation at 30 °C (top) and 250 °C (bottom).

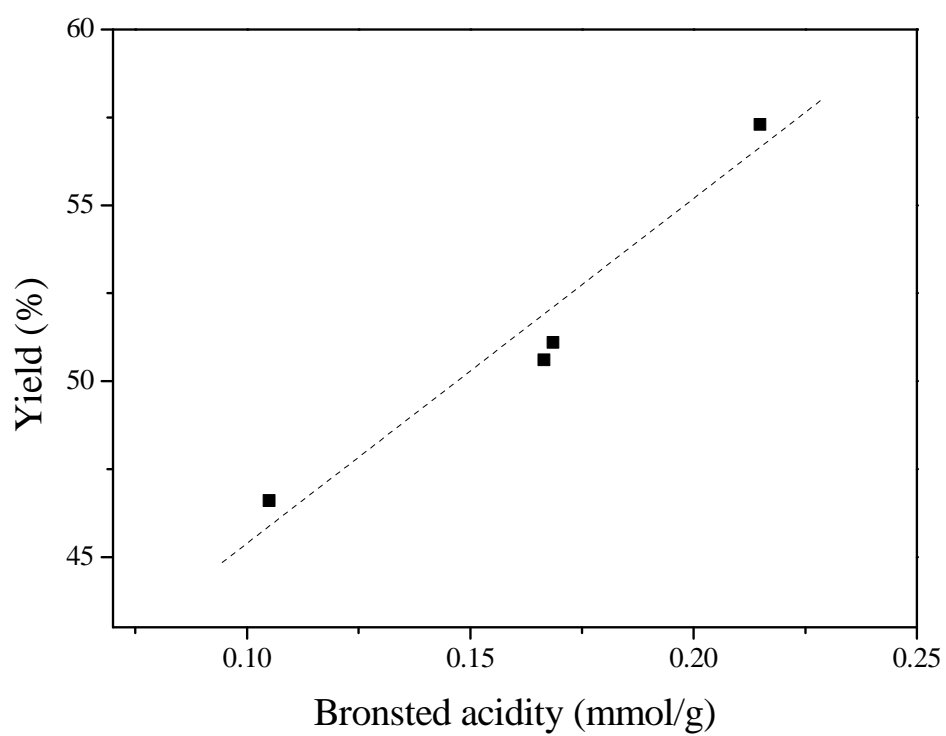


Fig. S4 Correlation between Bronsted acidity (at 150°C) and catalytic activity