Ordered mesoporous zirconium oxophosphate supported tungsten oxide solid acid catalysts: the improved Brønsted acidity for benzylation of anisole

Zhichao Miao^{a,b}, Huahua Zhao^a, Huanling Song^{a,c}, Lingjun Chou^{a,c*}

^a State Key Laboratory for Oxo Synthesis and Selective Oxidation, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, People's Republic of China.

^b University of Chinese Academy of Sciences, Beijing 100049, People's Republic of China.

^c Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215123, People's Republic of China.



Figure S1. Wide-angle X-ray diffraction patterns of $ZrP_{sol-gel}$ and 20 wt%WO₃/ $ZrP_{sol-gel}$



Figure S2. IR spectra for pyridine adsorbed on the 20 wt%WO₃/M-ZrPO recorded at

different temperature: (a) 150, (b) 200, (c) 250, (d) 300 and (e) 400 °C.



Figure S3. Isotherms (1) and pore size distribution (2) of 20 wt%WO₃/M-ZrPO-used

after five cycles.



Figure S4. TEM images of 20 wt%WO₃/M-ZrPO-used after five cycles.