Electronic Supplementary Information

Controlling crystal growth of MIL-100(Fe) on Ag nanowire surface for optimizing catalytic performance

Xi Chen,*[,1] Yanshuang Zhang,[1] Xiangyun Kong,[1] Zanru Guo,[1] Wenyuan Xu,[1] Zhili Fang,[1] Shaohui Wang,[1] Lingzhi Liu,[2] Yongxin Liu*[,1] and Jiali Zhang*[,1]

[1]School of Materials Science and Engineering, East China Jiaotong University, Shuanggang Road 808, Nanchang, 330013, People's Republic of China

[2]State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Renmin Street 5625, Changchun 130022, People's Republic of China

Materials and instrumentation

Trimesic acid (98%), ferric chloride ($FeCl_3$, >95%), ferrous chloride ($FeCl_2 \cdot 4H_2O$, >95%), Sodium hydroxide (NaOH, 97%), Sliver nitrate ($AgNO_3$, >95%), ethylene glycol (EG, AR), acetone and ethanol were purchased from Chinese domestic suppliers. Polyvinylpyrrolidone (PVP, Mw = 40000, reagent grade) was purchased from TCI.

Powder X-ray diffraction patterns (XRD) of the products were obtained on a Bruker D8 Focus diffractometer equipped with Cu Kα radiation and a Lynx Eye detector. Field-emission scanning electron microscopy (FESEM) and Transmission electron microscopy (TEM) images were observed on a Hitachi su8010 scanning electron microscope and a FEI Tecnai F20 transmission electron microscopy, respectively. Thermogravimetric analyses (TGA) were performed with a Netzsch STA 449 F3 instrument under flowing air with a heating rate of 10 °C min^{-1}. N_2 adsorption measurements were performed with a Micromeritics ASAP2020 instrument surface area analyzer at 77K. The Brunauer–Emmett–Teller (BET) method was used to calculate the specific surface area. The concentration of 4-nitrophenol was measured by UV-Vis spectroscopy (UNICO UV-4802S). FT-IR spectra were registered on a PerkinElmer Spectrum Two FT-IR (USA) spectrophotometer in the scanning range of 4000-500 cm^{-1} using KBr pellet method. X-ray photoelectron spectra (XPS) were acquired with a PHI 5702 spectrometer equipped with an Al K α exciting source.

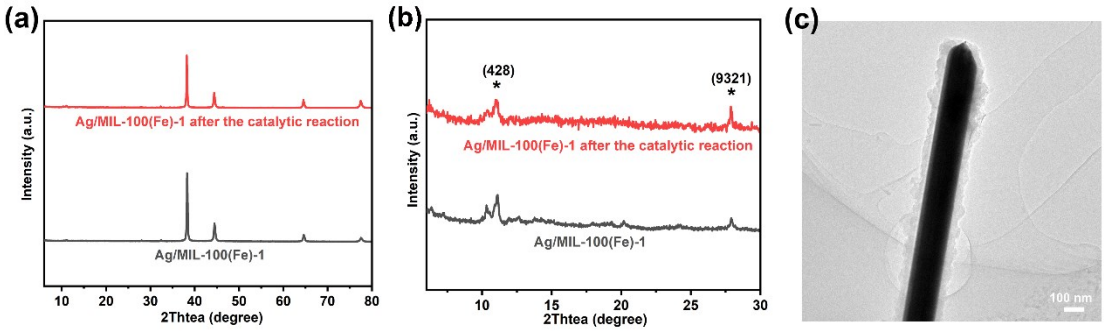

Fig. S1 XRD patterns (a, b) and TEM image of Ag/MIL-100(Fe)-1 after the catalytic reaction.

To better define the diffraction peaks of MIL-100(Fe), a magnified figure of the XRD pattern with a 2θ range of 5-30° is provided in Figure S1b, in which the peaks at 11° (428) and 27.7° (9321) corresponding to the intrinsic MIL-100(Fe) crystals as reported previously are maintained after the catalytic reaction.