

Supplementary Materials in New Journal of Chemistry for

**“Effect of Co addition on catalytic activity of FePCCu  
amorphous alloy for methylene blue degradation”**

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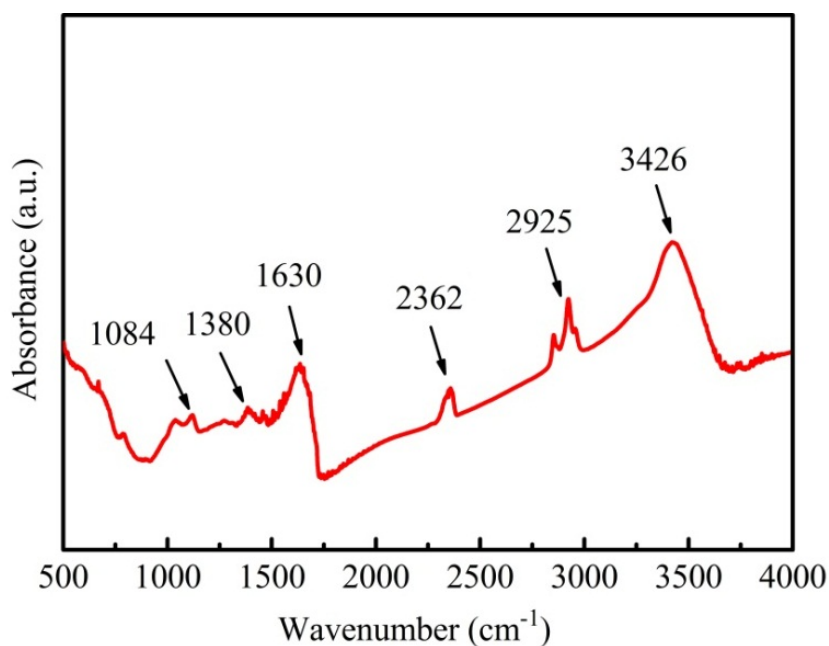


Fig. S1 FTIR spectrum of by-products in MB solution after-degradation using  $\text{Fe}_{79.2}\text{Co}_4\text{P}_{10}\text{C}_6\text{Cu}_{0.8}$  ribbons ( $T = 298 \text{ K}$ ,  $C_{\text{MB}} = 100 \text{ mg/L}$ ,  $C_{\text{H}_2\text{O}_2} = 1 \text{ mM}$ , ribbon dosage =  $0.5 \text{ g/L}$ , and  $\text{pH} = 3$ )

After degradation, some by-products in the reaction solution were observed. To identify these, the byproducts powder was extracted by centrifuge (TDZ5-WS, speed:  $2500 \text{ r/min}$ ) and dried in a vacuumed oven ( $100 \text{ }^\circ\text{C}$  for  $40 \text{ min}$ ). Then, the FTIR spectrum of byproducts powder was recorded on a FTIR spectrometer (Thermo Scientific, Nicolet iS10) with the baseline subtracted, as shown in Fig. S1. Several notable absorption peaks showed on the FTIR spectrum. The broad absorption peaks in the region  $2800\text{-}3720$  and  $2362 \text{ cm}^{-1}$  were attributed to the stretching vibration of methylene groups and hydroxyl groups. The peaks in  $1630$  and  $1380 \text{ cm}^{-1}$  were associated with C=C and C=O groups, while the peak at  $1084 \text{ cm}^{-1}$  was attributed to C-N groups. All these functional groups coming from reaction products suggest the occurrence of Fenton-like reaction in MB solution using  $\text{Fe}_{79.2}\text{Co}_4\text{P}_{10}\text{C}_6\text{Cu}_{0.8}$  ribbons.

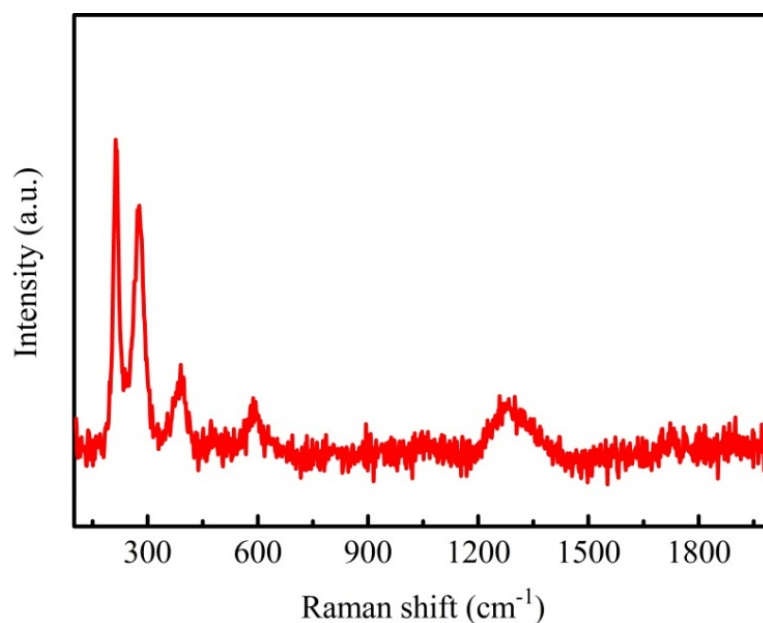


Fig. S2 Raman spectrum of by-products in MB solution after-degradation using  $\text{Fe}_{79.2}\text{Co}_4\text{P}_{10}\text{C}_6\text{Cu}_{0.8}$  ribbons ( $T = 298 \text{ K}$ ,  $C_{\text{MB}} = 100 \text{ mg/L}$ ,  $C_{\text{H}_2\text{O}_2} = 1 \text{ mM}$ , ribbon dosage =  $0.5 \text{ g/L}$ , and  $\text{pH} = 3$ )

The Raman spectrum of by-products powder was recorded on a Raman Microscope (LabRAM HR UV-Visible, Horiba Jobin Yvon) as shown in Fig. S2. The obvious peaks from  $\text{Fe}_2\text{O}_3$  ( $217 \text{ cm}^{-1}$ ),  $\text{Fe}_3\text{O}_4$  ( $286 \text{ cm}^{-1}$  and  $590 \text{ cm}^{-1}$ ),  $\text{Fe}_3\text{O}_4$  and  $\text{FeOOH}$  ( $394 \text{ cm}^{-1}$ ) were detected. Moreover, a broad peak at  $1275 \text{ cm}^{-1}$  was found, which is attributed to  $\text{FeOOH}$ ,  $\text{Fe}_2\text{O}_3$  and organic compounds, indicating the oxidation of zero-valent iron during Fenton-like reaction.