Supporting information for

Fabrication of a novel core-shell-shell magnetic composite with excellent performance for papain adsorption

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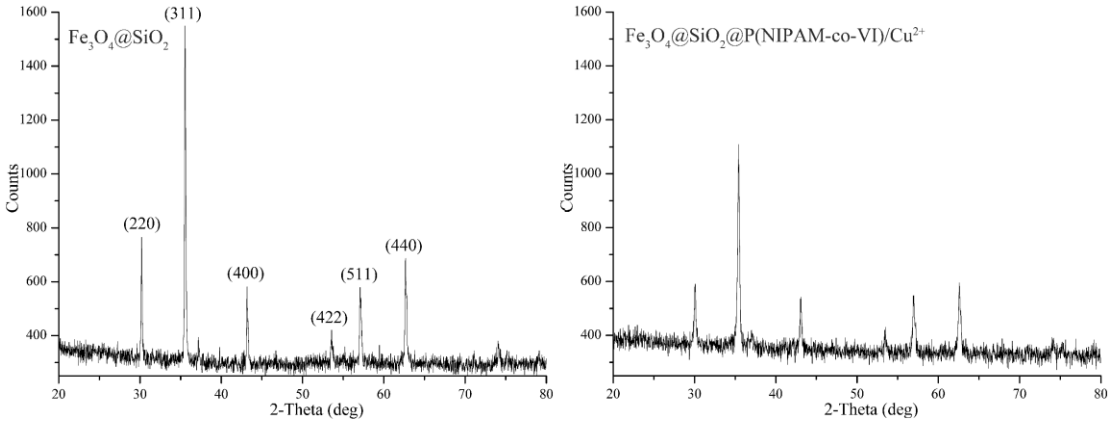

Fig. S1 PXRD spectrum of $Fe_3O_4@SiO_2$ and $Fe_3O_4@SiO_2@P(NIPAM\text{-}co\text{-}VI)/Cu^{2+}$

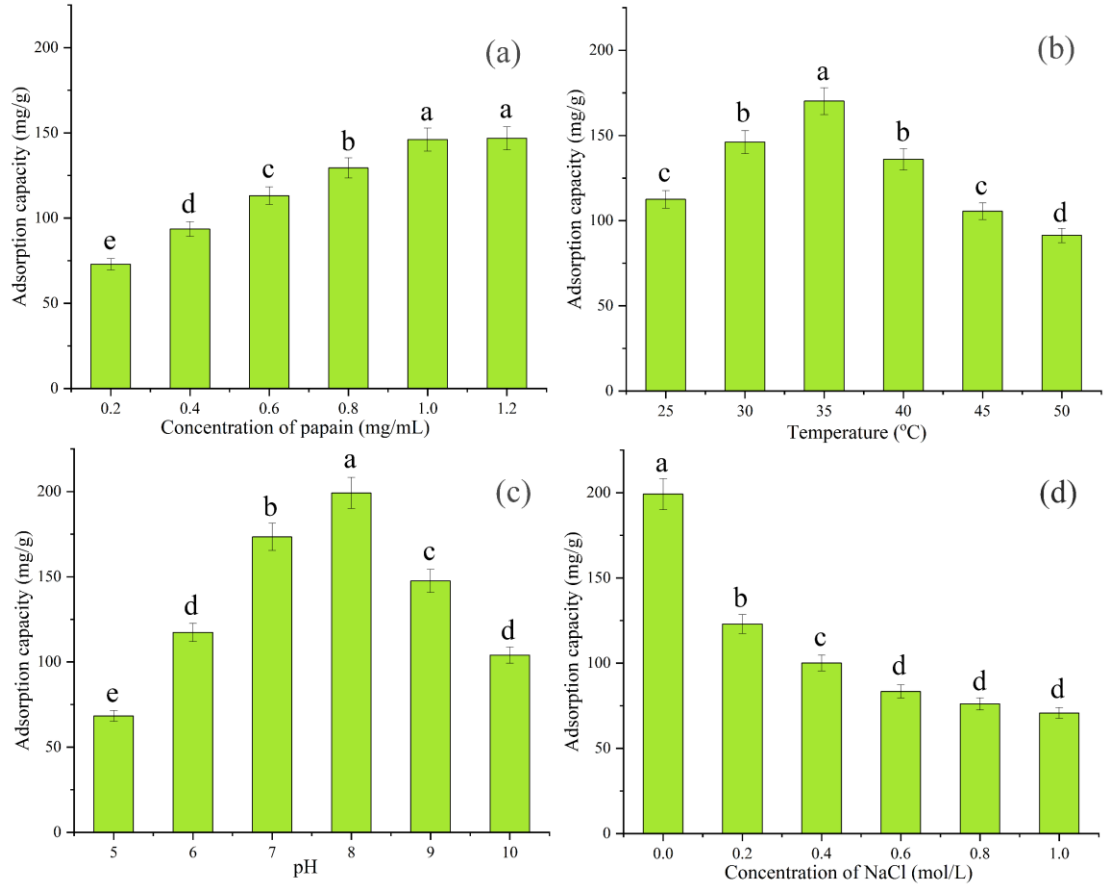

Fig. S2 Effects of the initial concentration of papain (a), temperature (b), pH (c) and concentration of NaCl (d) on the adsorption capacity of papain. Data with different letters show significant difference ($p < 0.05$).

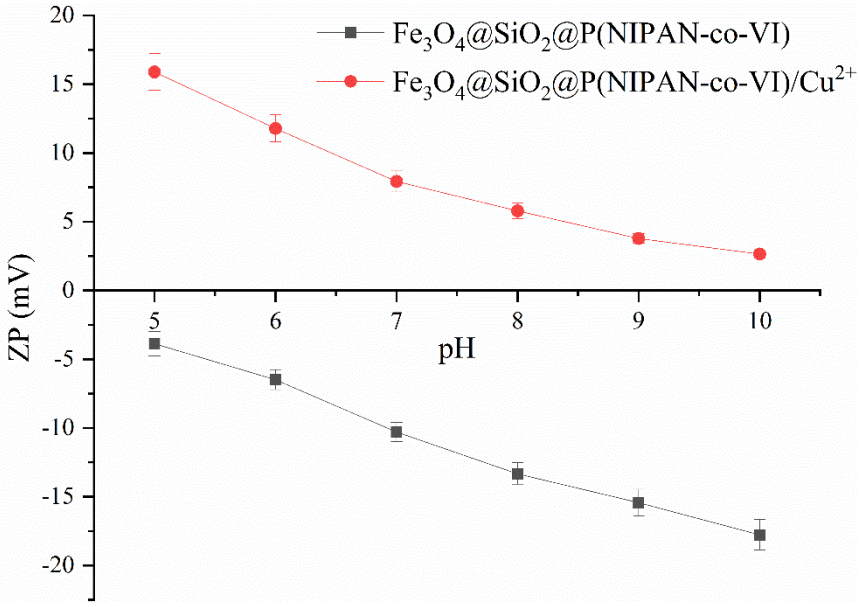

Fig. S3 Zeta-potential of Fe_3O_4@SiO_2@P(NIPAM-co-VI) and Fe_3O_4@SiO_2@P(NIPAM-co-VI)/Cu^{2+} at different pH values

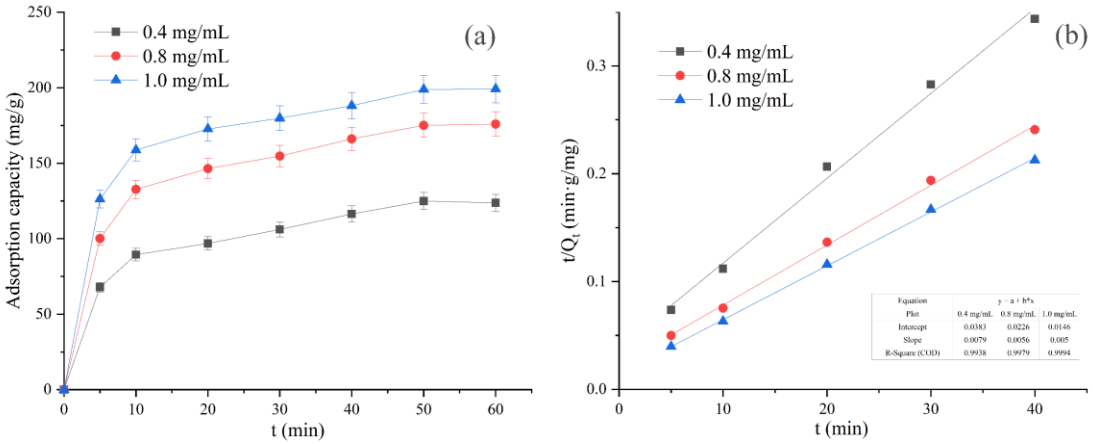

Fig. S4 The adsorption kinetics curves (a) and fitted plots of the pseudo-second order model (b) for the adsorption of papain onto the Fe_3O_4@SiO_2@P(NIPAM-co-VI)/Cu^{2+}

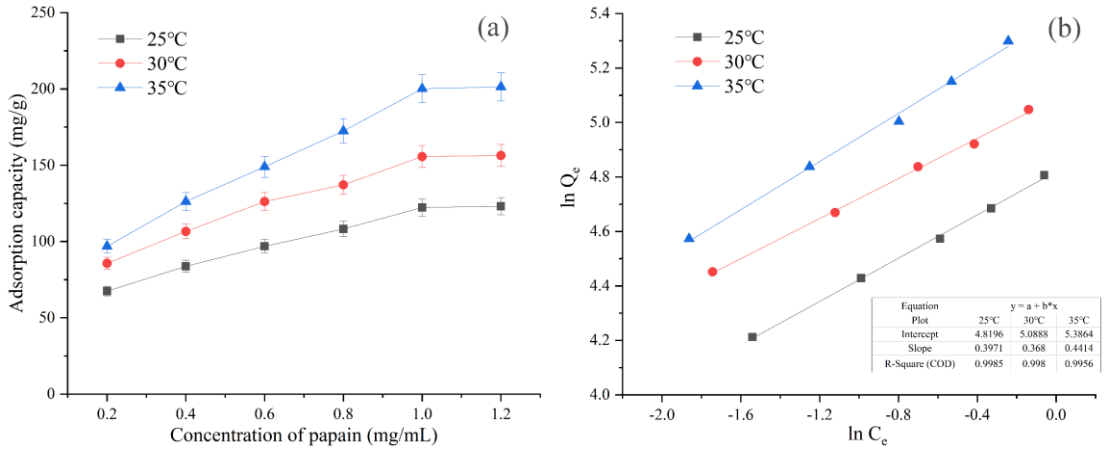

Fig. S5 The adsorption isotherms of papain at 25, 30 and 35°C (a) and the fitted plots of Freundlich equation (b)

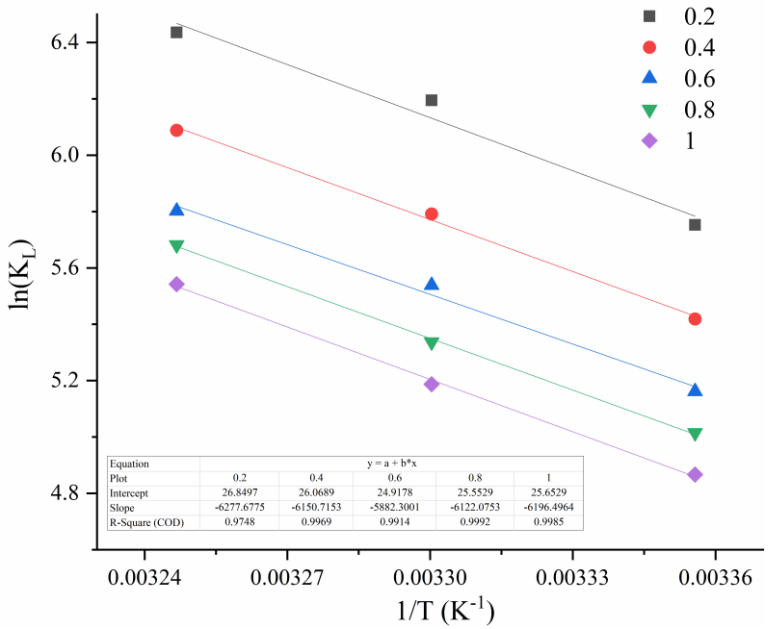

Fig. S6 The fitted plots of ln(K_L) to 1/T at different concentration of papain