Supporting Information

Magnetic Nanoparticles for Affinity Adsorption of Maltose Binding Protein (MBP) Fusion Enzymes

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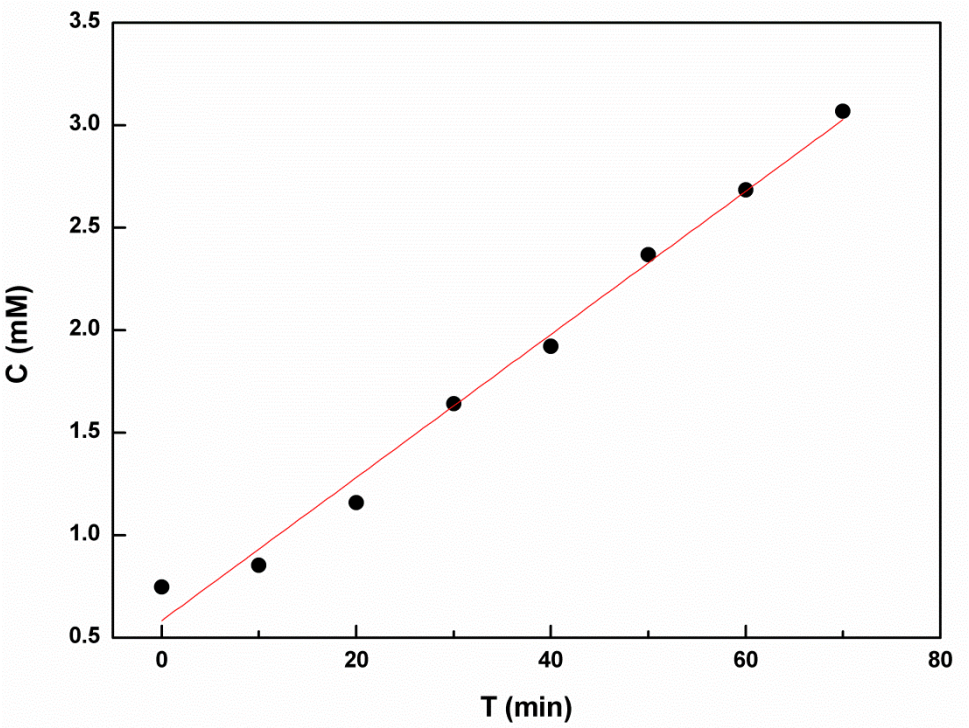

Fig. S1 The Time-Concentration curve of unsaturated uronic acid (the product) in MBP-HepA enzymatic reaction measured by UV-vis at 232 nm with MBP-HepA immobilized on Fe_3O_4@SiO_2-PEO-mal.

Table S1 Elementary analysis by XPS.

Element	Molar ratio[a]	Molar ratio[b]
Si	**67.5**	**25.8**
O	**100**	**100**
N	**15.6**	**8.33**

[a] The element molar ratio of Fe_3O_4@SiO_2-NH_2. [b] The element molar ratio of Fe_3O_4@SiO_2-PEO.

Table S2 The enzyme activity results of MBP-HepA immobilized on Fe_3O_4@SiO_2-PEO-mal.

Apparent immobilized enzyme activity[a] / (IU/g)[b]	**31.5**
Adsorption enzyme activity[c] / (IU/g)	**245**
Enzyme adsorption capability / (mg/g)	**96.6**
Enzyme activity conservation ratio[d] / %	**12.8**
Enzyme grafting density[e] / (molecule/nm^2)	**0.0155**
Enzyme grafting ratio[f] / %	**87.6**

[a] Apparent immobilized enzyme activity was measured by UV 232 method.

[b] One international unit (IU) is defined as the amount of protein which can form 1 μmol unsaturated uronic acid per minute at 30 ^{o}C.

[c] Adsorption enzyme activity is defined as the theoretical immobilized enzyme activity on the assumption that the immobilized enzymes have the same activity as the free enzyme.

[d] Activity conservation ratio is defined as the ratio of apparent immobilized enzyme activity and adsorption enzyme activity.

[e] Enzyme adsorption density (ρ_{enzyme}) was calculated according to eqn (1).

[f] Enzyme adsorption ratio is defined as $\rho_{enzyme}/\rho_{maltose}$.