Colorimetric biosensing of glucose in human serum based on the intrinsic oxidase activity of hollow MnO_2 nanoparticles

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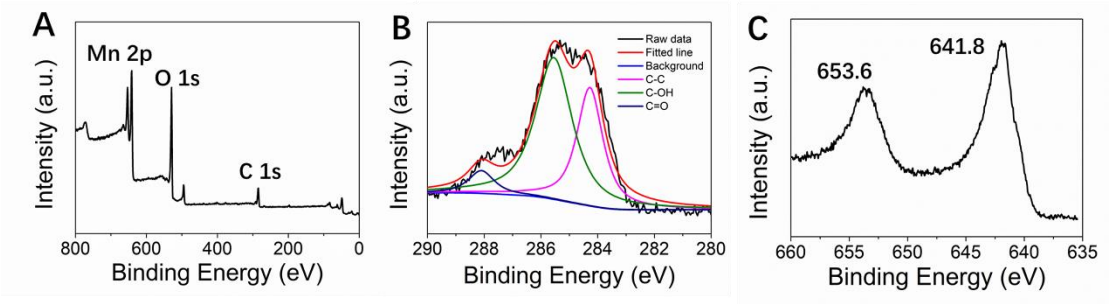

Fig. S1. (A) XPS full-scan spectra, (B) high-resolution C 1s and (C) high-resolution Mn 2p XPS spectra of H-MnO_2 NPs.

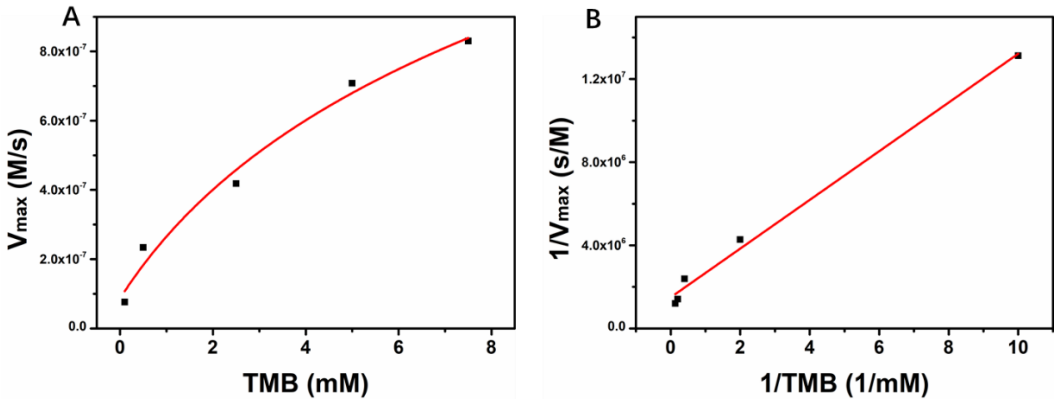

Fig. S2. The initial velocities in the oxidization of TMB were measured at pH 4.0. (A) Kinetic plot of v against TMB concentration. (B) Double-reciprocal plot generated from (A).

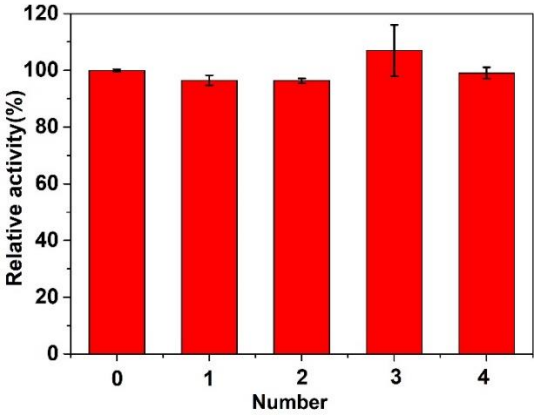

Fig. S3. The relative activity of H-MnO_2. (Number 0 stands for the activity of H-MnO_2 NPs before nearly a year. The Number 1-4 stand for the current activity of H-MnO_2 NPs)

Table S1. Comparison of the kinetic parameters between H-MnO_2 NPs and other materials. V_{max} is the maximum rate of conversion, K_m is the Michaelis constant.

Catalyst	K_m /mM	V_{max}/μM s^{-1}	Reference
H-MnO_2	0.781	0.668	This work
Fe_3O_4	0.098	0.0344	[1]
CeO_2	3.8	0.7	[1]
MnO_2-Silk films	1.62	2.66	[2]
PANi-MnO_2-Pd NWs	0.13	0.30	[3]
$ZnFe_2O_4$ MNPs	0.85	0.13	[4]
CuZnFeS NCs	2.2	0.39	[5]

Table S2. Comparison of the performance of our method with other biosensors for measuring glucose concentration in human serum samples.

Biosensor	Linear range (μM)	LOD (μM)	Reference
GOx@ZIF-8(NiPd)	10-300	9.2	[6]
VS_2 nanosheets	5-250	1.5	[7]
Au NPs	2-200	0.5	[8]
GOx-Cu nanoflower	10-200	3.5	[9]
Carbon dots	200-2500	60	[10]
H-MnO_2 NPs	1-200	0.84	This work

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