Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

GOX-Hemin Nanogels with Enhanced Cascade Activity for Sensitive One-Step Glucose Detection

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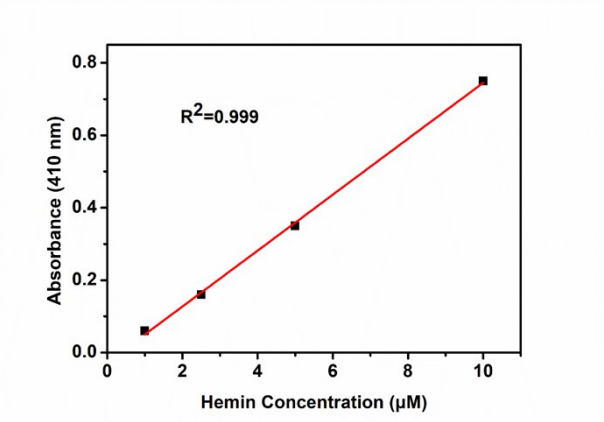

Fig. S1 The standard curve of hemin in DMSO.

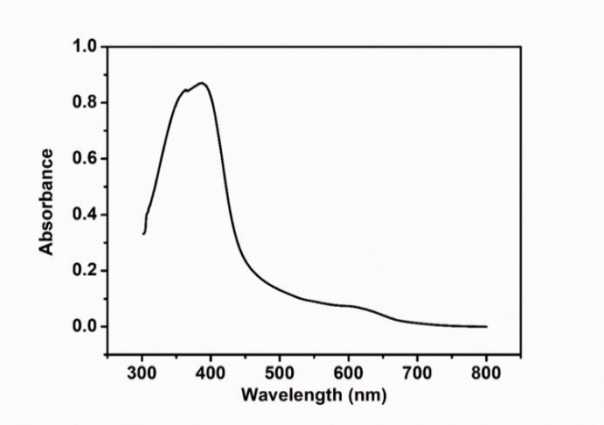

Fig. S2 The absorbance spectrum of GHN in PBS solution (1.1 μM hemin equivalent)

Fig. S3 The image of the sample solution from left to right is the aqueous solution of hemin, mixture of hemin and GOX, and GHN, indicating after hemin was polymerized onto GOX, it became soluble in aqueous solution.

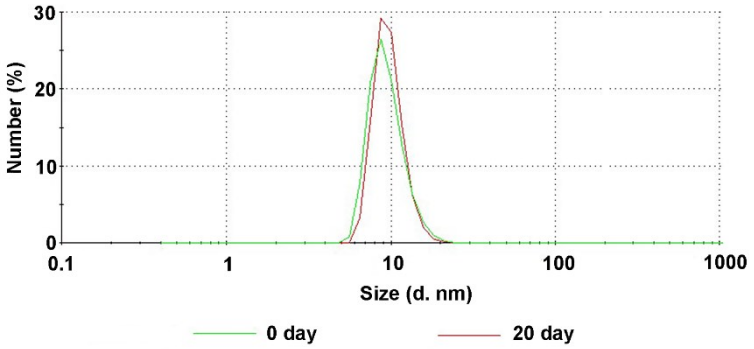

Fig. S4 Detecting the size stability of the GHN at room temperature. The size of the prepared GHN was almost unchanged after kept at room temperature for 20 days.

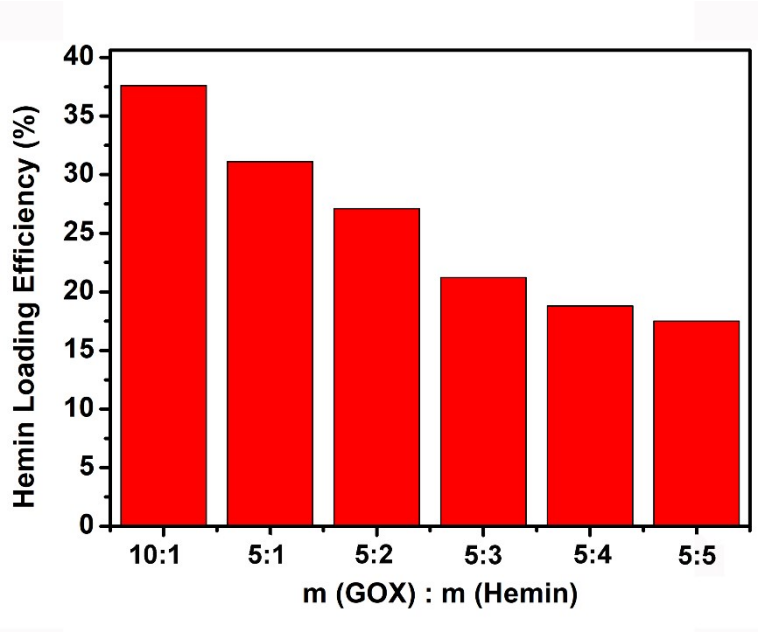

Fig. S5 Hemin loading efficiency for preparing GHN at different GOX/Hemin ratios.

Table S1 Kinetic parameters for the peroxidase like activity of GOX-hemin nanogel (GHN), and GOX activity of GOX-porphyrin nanogel (GPN) and native GOX.

Catalyst	Substrate	Km (mM)	k_{cat} (min^{-1})	K_M/k_{cat} ($M^{-1}min^{-1}$)
GHN	H_2O_2	12.52	8.1	650
GOX	glucose	8.97	15722	1.75×10^6
GPN	glucose	13.62	21813	1.60×10^6

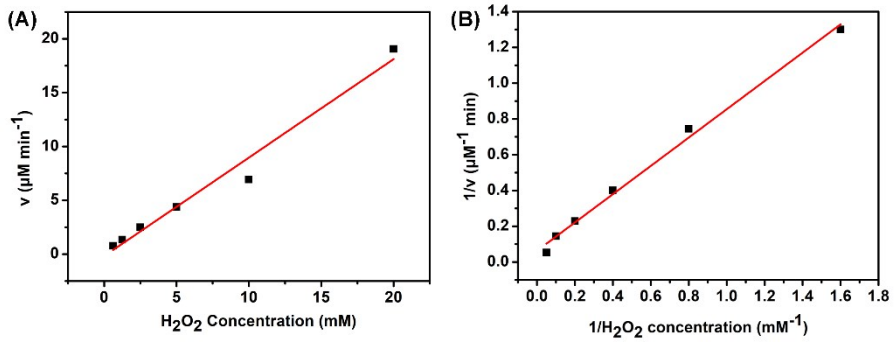

Fig. S6 Steady-state kinetic assays for the peroxidase like activity of GHN. (A) Michaelis–Menten and (B) Lineweaver-Burk plots for the H_2O_2 substrate.

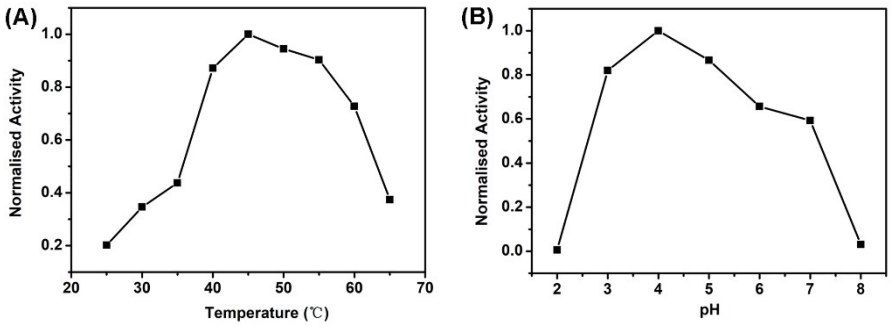

Fig. S7 The optimal (A) temperature and (B) pH for the peroxidase like activity of GHN.

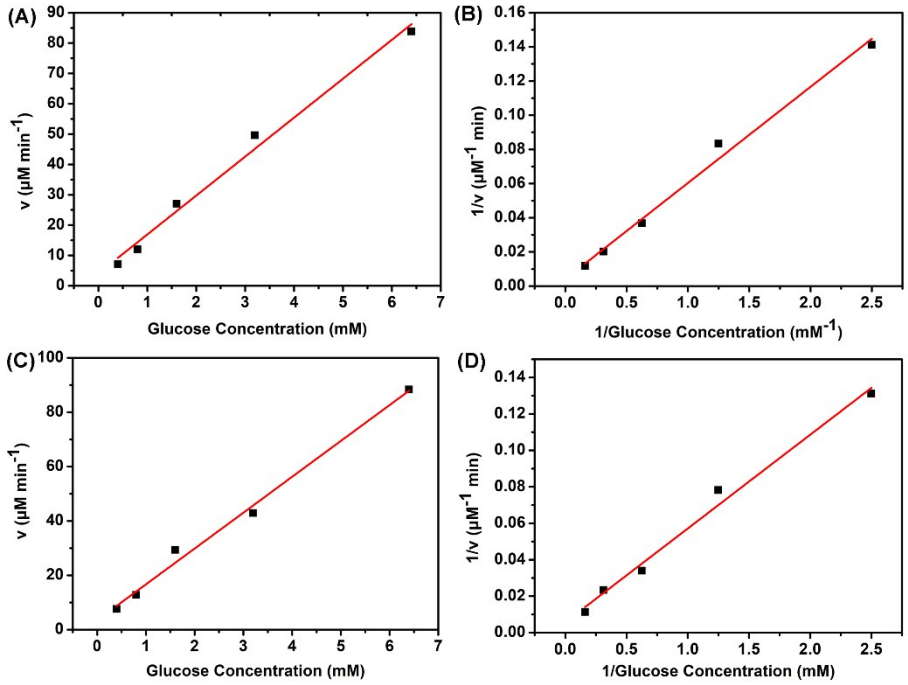

Fig. S8 Steady-state kinetic assays for the GOX activity of GPN and GOX. (A) Michaelis–Menten and (B) Lineweaver-Burk plots for the GOX activity of GPN. (C) Michaelis–Menten and (D) Lineweaver-Burk plots for GOX.

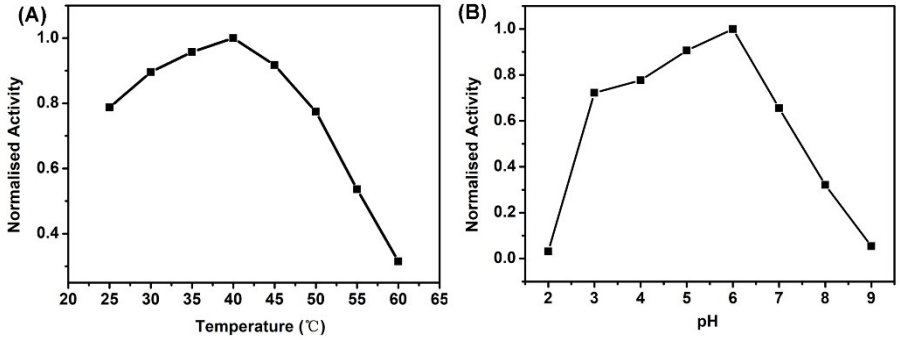

Fig. S9 The optimal (A) temperature and (B) pH for the GOX activity of GPN.

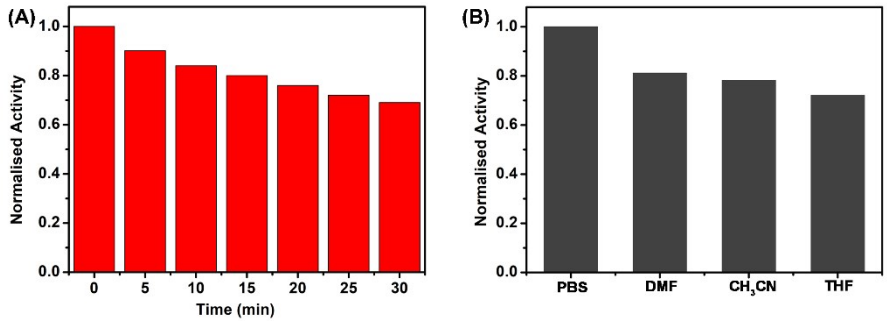

Fig. S10 (A) Relative glucose detection activity of GHN after being incubated at 55 ℃ for 0 to

30 min. (B) Relative glucose detection activity of GHN after being incubated for 25 min at room temperature in 20% (v/v) aqueous solution of DMF, CH_3CN and THF (Incubation in PBS as a control).

Table S2 Comparison of the limitation of determination (LOD) for glucose on basis of different materials

Materials	LOD (μM)	Method	Reference
Fe_3O_4	30	colorimetry	1
Co_3O_4 NPs	5	colorimetry	2
BSA-Cu NCs	100	colorimetry	3
CeO_2/NT-TiO_2	6.1	colorimetry	4
Graphene Oxide	1	colorimetry	5
V_2O_5 nanozymes	10	colorimetry	6
GOX/Hemin nanogel	4	colorimetry	This work

References

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