Electronic Supplementary Information

Metal–organic framework MIL-53(Fe): Facile microwave-assisted synthesis and use as a highly active peroxidase mimetic for glucose biosensing

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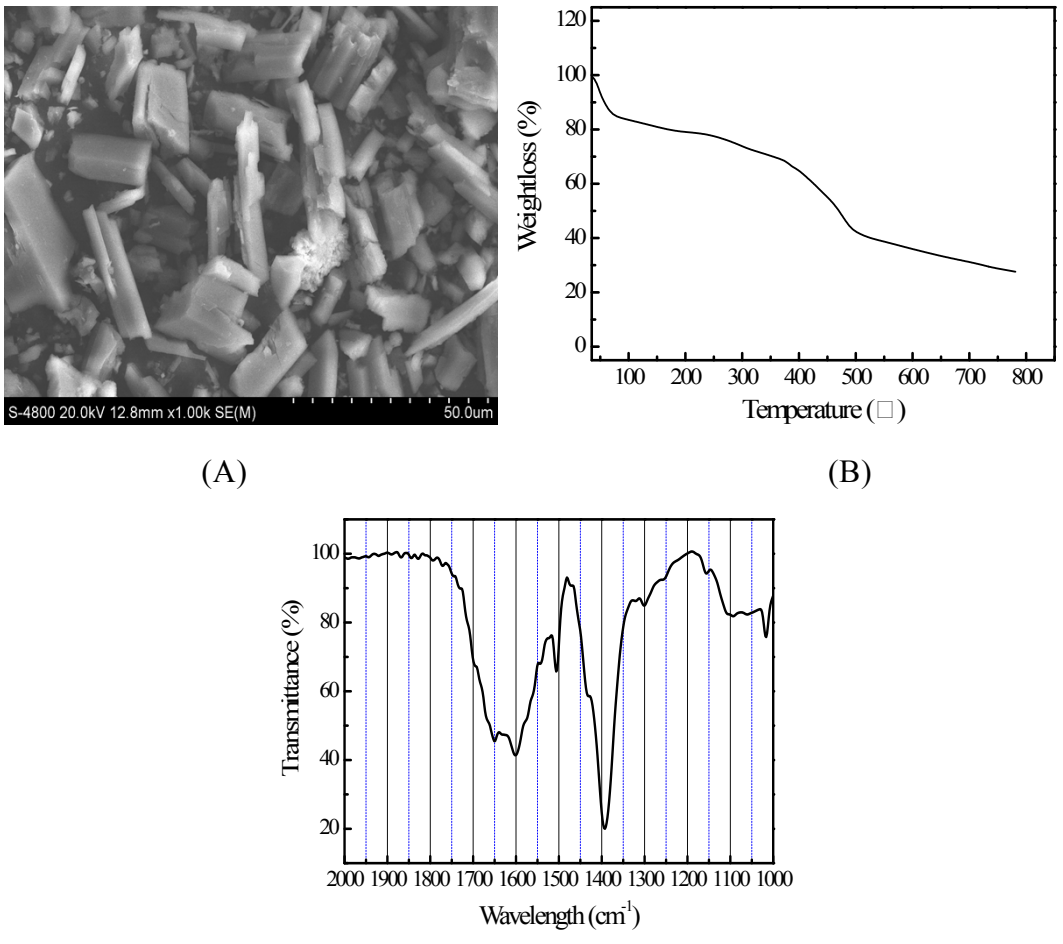
Table S1. Reproducibility between different batches of the as-prepared MIL-53(Fe) using the same preparation method.

Batch No.	1	2	3	RSD (%)
Catalytic activity (%)	99.33±1.03[a]	91.08±1.27[a]	100±0.46[a]	3.94

[a] SD for three duplicate determinations.

As can be seen from Table S1, the second batch has lower catalytic activity as compared to batch 1 and batch 3. This is probably due to their different preparation time. The materials for batch 1 and 3 were prepared on November 22th and 23 th, 2014. Whereas, the material for batch 2 was prepared 20 days ago. The reproducibility test was carried out on November 24th, 2014. Hence, we speculate that after 20-day storage, the catalytic activity of the material for batch 2 would decrease.



(A) (B)

(C)

Figure S1. (A) SEM image of MIL-53(Fe) by CE. (B) The TG curve of the as-prepared MIL-53(Fe). (C) FT-IR spectrum of the as-prepared MIL-53(Fe).

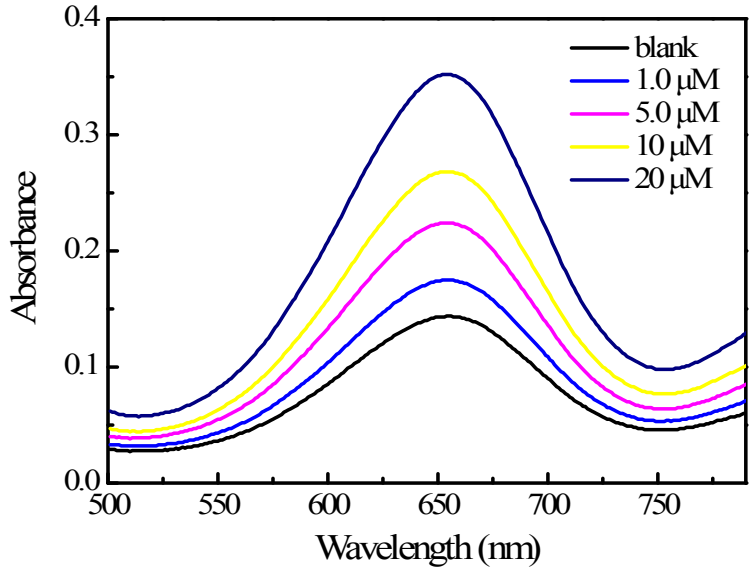


Figure S2. The UV-visible absorption spectra of TMB– MIL-53(Fe) system in the presence of different concentrations of H_2O_2.

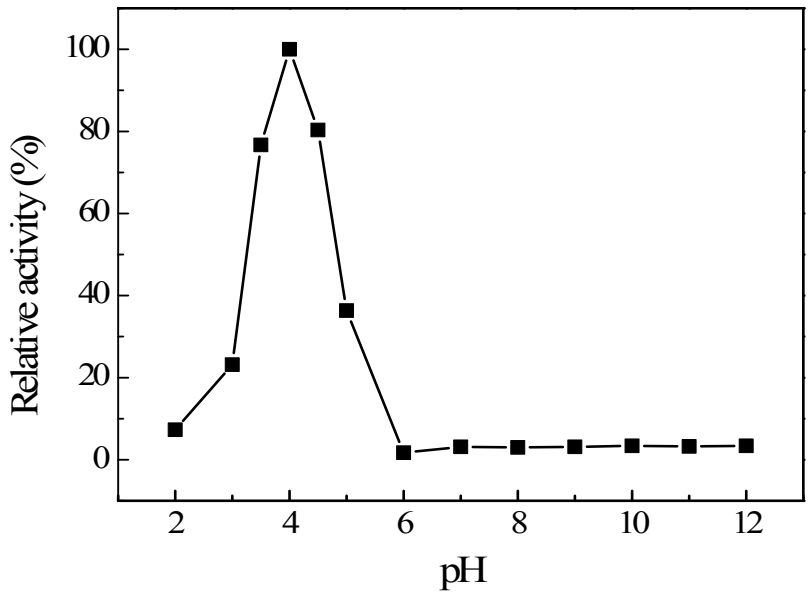


Figure S3. The effect of pH on the catalytic activity of the synthesized MIL-53(Fe). Reaction conditions: 8 mg L^{-1} MIL-53(Fe), 0.1 mM H_2O_2, 0.05 mM TMB, 0.2 M NaAc buffer, 45 °C for 20 min. The maximum point in the curve was set as 100 %.

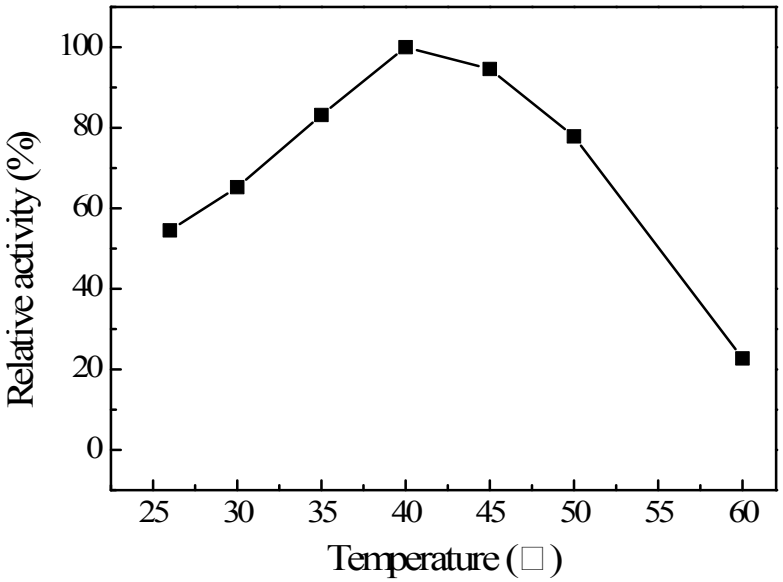


Figure S4. The effect temperature on the catalytic activity of the synthesized MIL-53(Fe). Reaction conditions: 8 mg L^{-1} MIL-53(Fe), 0.1 mM H_2O_2, 0.05 mM TMB, 0.2 M acetate buffer (pH 4.0), 20 min reaction time. The maximum point in the curve was set as 100 %.

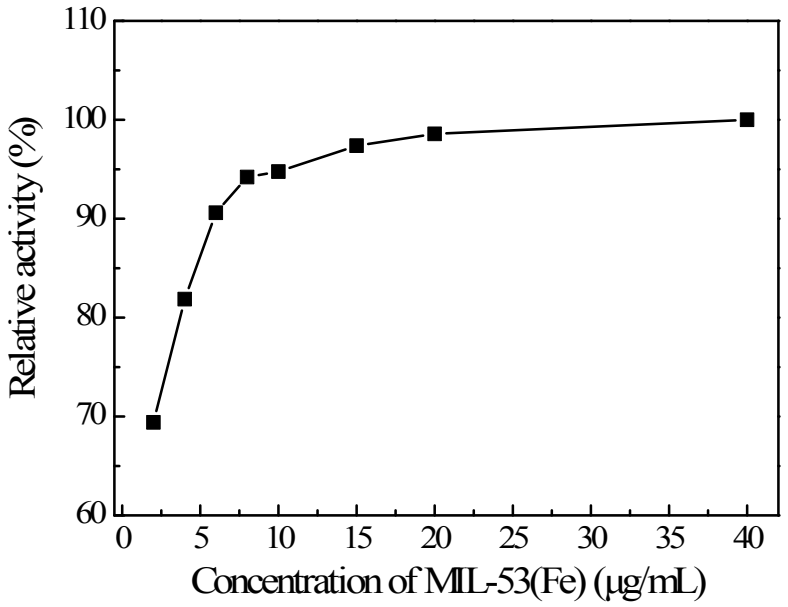


Figure S5. The effect of MIL-53(Fe) concentration on the catalytic activity of the synthesized MIL-53(Fe). Reaction conditions: 0.1 mM H_2O_2, 0.05 mM TMB, 0.2 M acetate buffer (pH 4.0), 40 °C for 20 min. The maximum point in the curve was set as 100 %.

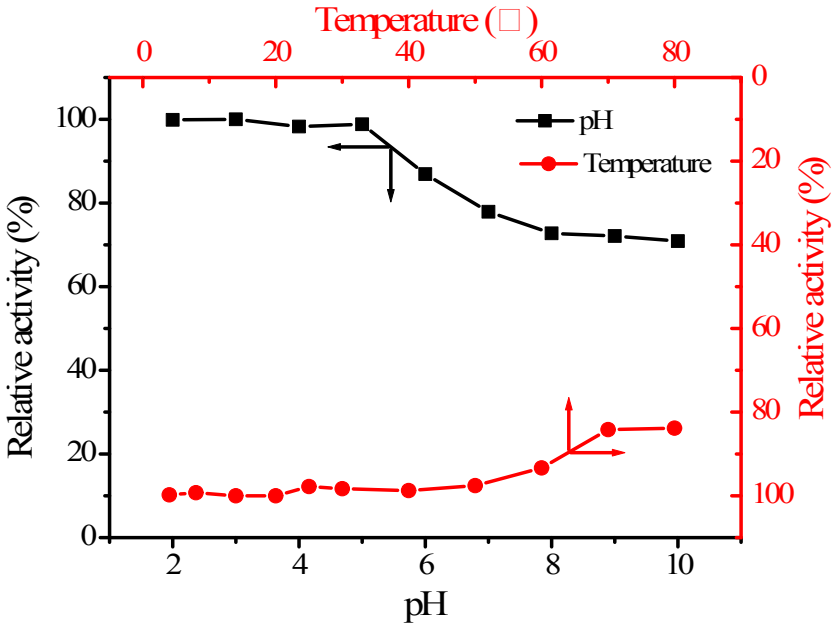


Figure S6. The stability of the as-prepared MIL-53(Fe) as enzyme mimic at a range of temperatures (4–80 °C) and pH (2.0–10.0). The maximum point in each curve was set as 100 %.

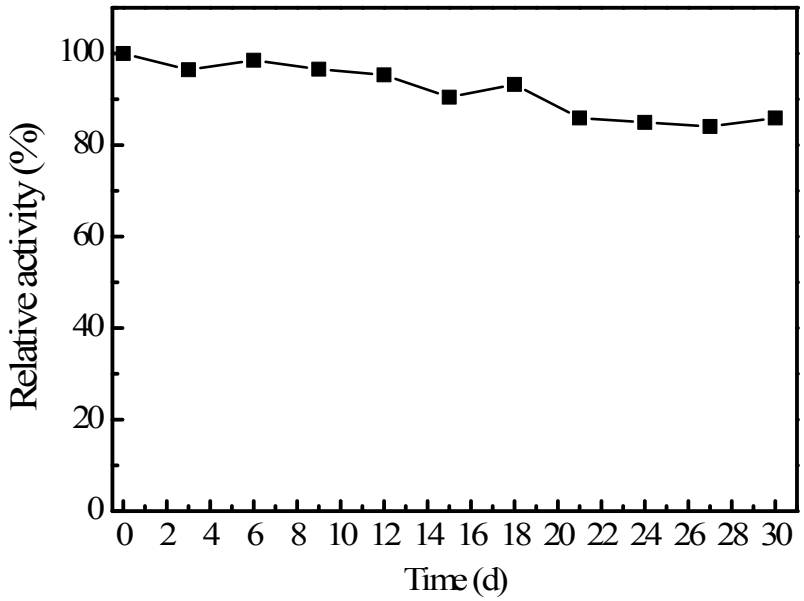


Figure S7. Variation of catalytic activity of the as-prepared MIL-53(Fe) with time. The maximum point in the curve was set as 100 %.

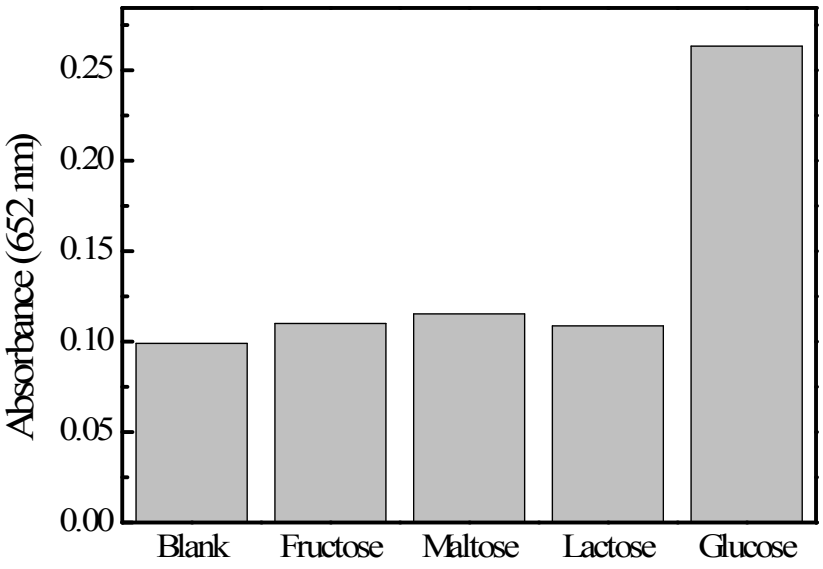


Figure S8. Determination of the selectivity of glucose detection was performed by 0.1 mM maltose, 0.1 mM lactose, and 0.1 mM fructose instead of 0.02 mM glucose under the same reaction conditions.