Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B. This journal is © The Royal Society of Chemistry 2020

Supporting Information for

Modified Ti₃C₂ nanosheets as peroxidase mimetics for use in

colorimetric detection and immunoassays

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Scheme S1. Schematic illustration of the etching and ultrasonication process for Ti_3AlC_2



Figure S1. (A) High resolution TEM image and (B) statistics analysis of diameter of Ti_3C_2 nanosheets.





Figure S2. Steady-state kinetic assay of Naked- Ti_3C_2 and Ala- Ti_3C_2 . (A, B, E, F) TMB or H_2O_2 concentration-dependent on the reaction rate and (C, D, G, H) the corresponding double-reciprocal plots respectively.



Figure S3. (A) Selectivity analysis for glucose detection.

	Catalyst	Linear range	LOD (µM)	Ref.
		(μΜ)		
Solution	N-doped carbon	2 - 50	1.14	1
system	C-dots/V ₂ O ₅	0.7 - 300	0.7	2
	Co ₃ O ₄ MNPs	200 - 6000	86	3
	Naked-Ti ₃ C ₂	10 - 320	8.82	This work
	His-Ti ₃ C ₂	1.25 - 640	1.034	This work
Paper-based	HRP	500 - 4500	300	4
system	Zr-PCN-222 (Fe)	0 - 2500	250	5
	Co ₃ O ₄ -CeO ₂ nanosheets	5 - 1500	0.21	6
	Naked-Ti ₃ C ₂	10 - 640	10	This work
	His-Ti ₃ C ₂	10 - 640	10	This work

 Table S1. Comparison of analytical parameters for reported colorimetric glucose

 detection¹⁻⁶

Compared with other catalysts in different sensing systems, Ti_3C_2 nanozymes possess relatively broad linear range and low detection limit simultaneously. Furthermore, in a traditional glucose detection experiment, two steps were taken for the cascade reaction. while in the paper-based system, a one-pot assay strategy was introduced by combining the reaction zone and detection zone in the same area, which enable them to be a potential method to detect glucose in some poor regions where lack of expensive equipment. In addition, as the glucose concentration is in the range of 3 to 8 mM for healthy persons and 9 to 40 mM for diabetics, the linear detective range of Ti_3C_2 nanosheets is qualified for glucose detection. In brief, paper-based Ti_3C_2 nanozymes system meets the need of glucose detection in accuracy, simplicity, and portability.

Catalyst	Detection object	R	Ref.
g-C ₃ N ₄ QDs	cTnI	0.996	7
Cu(OH)2	Microcystin-LR	0.992	8
NC@DNAzyme			
Au NPs	haptoglobin	0.9748	9
Ti_3C_2 nanosheets	IR β-subunit	0.923	This work

Table S2. Comparison of correlation coefficients for reported immunoassay⁷⁻⁹

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