Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Visual detection of glucose by hydrogen peroxide test strips

*Lu Shi[1], Ruijuan Jiao[1], Wei Liu, Baoxin Li, Yan Jin**

Key Laboratory of Analytical Chemistry for Life Science of Shaanxi Province, Key Laboratory of Applied Surface and Colloid Chemistry, Ministry of Education, School of Chemistry and Chemical Engineering, Shaanxi Normal University, Xi'an 710119, China

* Corresponding author. Tel: 86-29-81530726; Fax: 86-29-81530727; E-mail: jinyan@snnu.edu.cn

[1]These two authors contributed equally to this work.

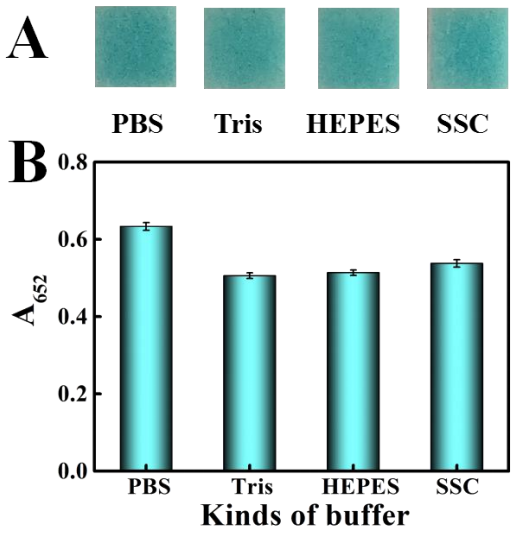

Figure S1. Effects of buffer on the change in color of H_2O_2 test strips (A) and absorbance at 652 nm (B). Error bars represent the standard deviations for three replicates.

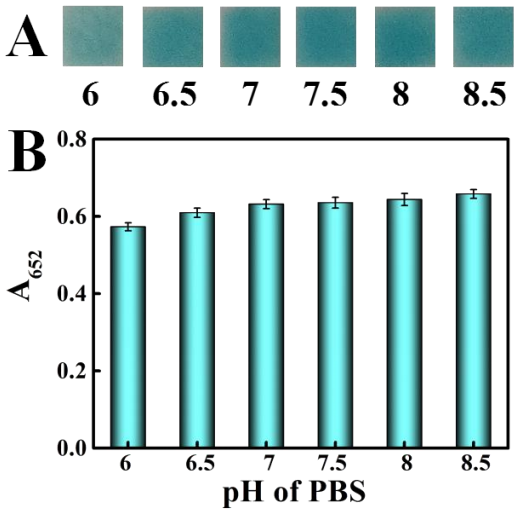

Figure S2. Effects of pH of buffer on the change in color of H_2O_2 test strips (A) and absorbance at 652 nm (B). Error bars represent the standard deviations for three replicates.

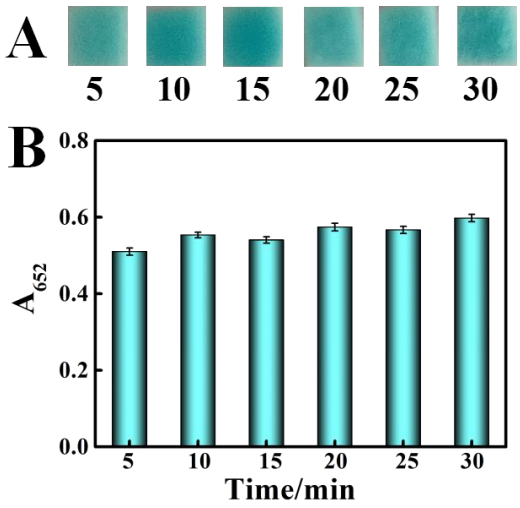

Figure S3. Effects of oxidation time on the change in color of H_2O_2 test strips (A) and absorbance at 652 nm (B). Error bars represent the standard deviations for three replicates.

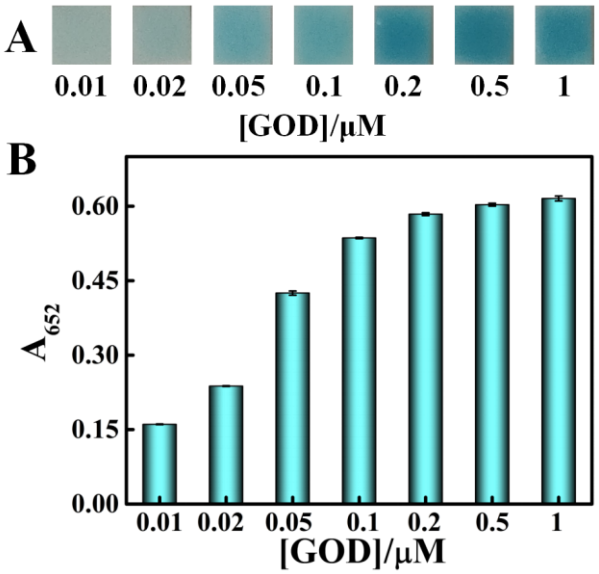

Figure S4. Effects of concentration of GOD on the change in color of H_2O_2 test strips (A) and absorbance at 652 nm (B). Error bars represent the standard deviations for three replicates.

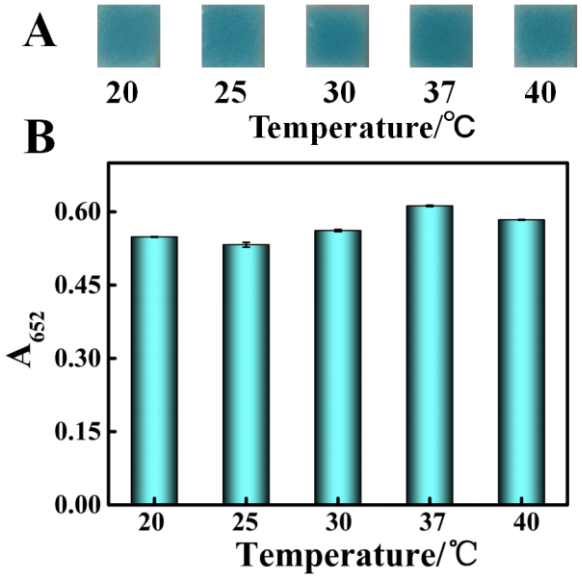

Figure S5. Effects of temperature on the change in color of H_2O_2 test strips (A) and absorbance at 652 nm (B). Error bars represent the standard deviations for three replicates.

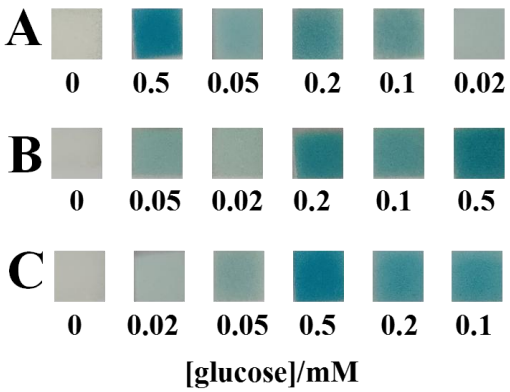

Figure S6. Colorimetric images of H_2O_2 test strips obtained for the analysis of 6 samples containing different concentrations of glucose (0, 0.02, 0.05, 0.1, 0.2 and 0.5 mM) for 3 times. The images were categorized in a fully random order in each group before naked-eye readout by 11 independent users. Each sample was eventually interpreted by 11 independent users according to the color reference chart shown in Figure 4A. In other words, each sample has totally 33 readouts (3 strips × 11 users). Each user interpreted his or her readout without intercommunication. All readouts are summarized in Figure 4B, with which the accuracy of semi-quantitative naked-eye detection can be estimated.

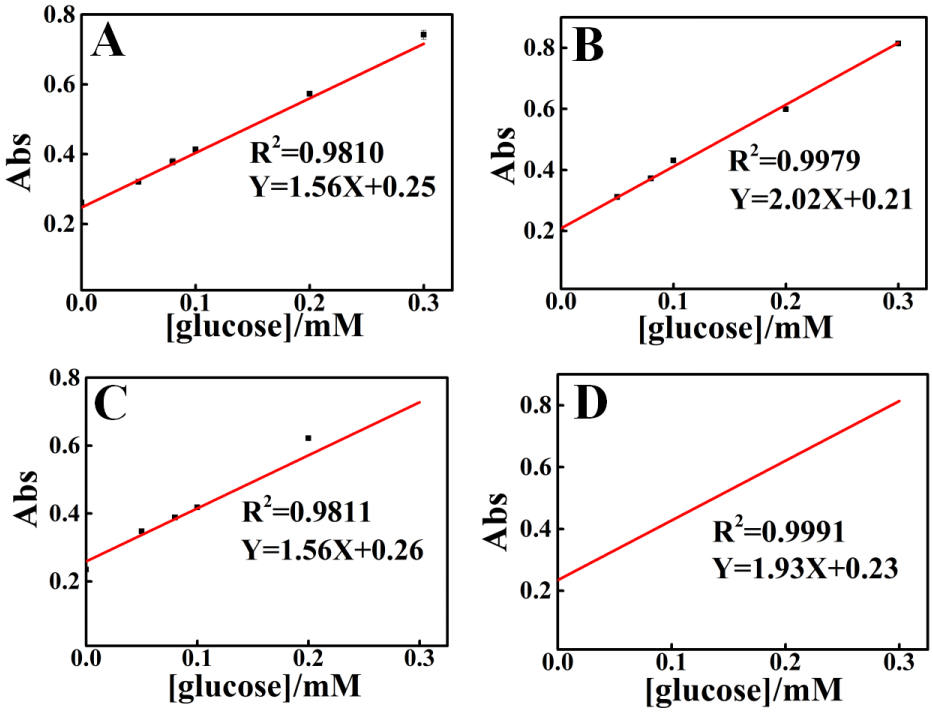

Figure S7. Standard addition plot of the trial in 1000-folds of diluted grape juice (A), orange juice (B), apple juice (C) and peach juice (D). Error bars represent the standard deviations for three replicates.

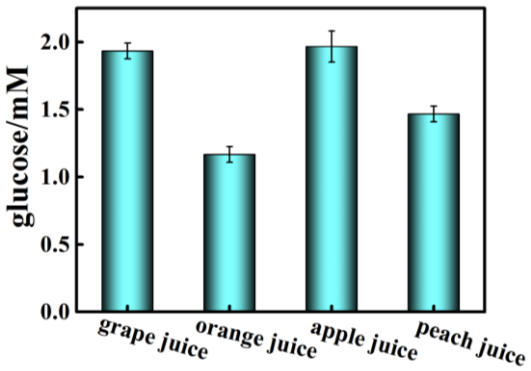

Figure S8. Glucose detection by commercial glucose meter for 100-folds of diluted grape juice (A), orange juice (B), apple juice (C) and peach juice (D). Error bars represent the standard deviations for three replicates.

Table S1. Comparision of the analytical performance of different methods for glucose detection.

Analtical Method	Linear range	Detection limit	Reaction time/min	Instrument used	refs
Fluorometric assay	0.5–250 μM	0.18 μM	50	Fluorescence spectrophotometer	1
Fluorometric assay	0.05-5 mM	50 μM	120	Fluorescence spectrophotometer	2
Electrochemical assay	10 μM-1 mM	50 μM	20	Electrochemical analyzer	3
Electrochemical assay	1-15 mM	33.2 μM	-	Electrochemical analyzer	4
Surface-enhanced Raman scattering assay	1–50 μM	0.39 μM	40	Micro confocal laser Raman spectrometer	5
Surface-enhanced Raman scattering assay	0.1 mM-1.0 M	0.5 mM	45	Raman spectrometer	6
Chemiluminescent assay	0.5-100 μM	0.1 μM	5	Chemiluminescence analyzer	7
Chemiluminescent assay	0.2 μM-3 mM	0.08 μM	30	Chemiluminescence analyzer	8
Colorimetric assay	0.005-0.5 mM	0.8 μM	45	UV-vis spectrophotometer	9
Colorimetric assay	0 -256μM	16 μM/ 4 μM	120	Naked eyes/UV-vis spectrophotometer	10
hydrogen peroxide test strips-based asay	0.01-0.5 mM	20 μM	5	Hydrogen peroxide test strips	This work

References

[1] J.P. Gu, X.Q. Li, Z. Zhou, W.Q. Liu, K. Li, J.W. Gao, Y. Zhao, Q.M. Wang, *Nanoscale*, 2019, **11**, 13058-13068.

[2] S. Jiang, Y. Zhang, Y. Yang, Y. Huang, G. Ma, Y. Luo, P. Huang, J. Lin, *ACS Appl Mater Interfaces.*, 2019, **11**, 10554-10558.

[3] S. Goggins, E.A. Apsey, M.F. Mahon, C.G. Frost, *Org. Biomol. Chem.*, 2017, **15**, 2459-2466.

[4] H.L. Kong, N. Rohaizad, M.Z.M. Nasir, J.G. Guan, M. Pumera, *Anal. Chem.*, 2019, **91**, 5660-5666.

[5] X. Cui, J. Li, Y. Li, M. Liu, J. Qiao, D. Wang, H. Cao, W. He, Y. Feng, Z. Yang, *Spectrochim. Acta A Mol. Biomol. Spectrosc.*, 2022, **266**, 120432.

[6] C. Fu, S. Jin, J. Oh, S. Xu, Y.M. Jung, *Analyst*, 2017, **142**, 2887-2891.

[7] Y. Gao, Y. Huang, J. Chen, Y. Liu, Y. Xu, X. Ning, *Anal. Chem.*, 2021, **93**, 10593-10600.

[8] J. Yu, M. Cao, H. Wang, Y. Li, *Mikrochim. Acta.*, 2019, **186**, 696.

[9] Q.Q. Wang, X.P. Zhang, L. Huang, Z.Q. Zhang, S.J. Don, *ACS Appl. Mater. Interfaces*, 2017, **9**, 7465-7471.

[10] X. Fan, J. Lim, Z. Li, T. Wang, L. Jiang, S. Liu, L. Zhou, C. He, *J. Mater. Chem. B.*, 2021, 9, 3509-3514.