
Supplementary Materials

Highly Crystalline Oxidase-Like MnOOH Nanowire-Incorporated Paper Dipstick for One-Step Colorimetric Detection of Dopamine

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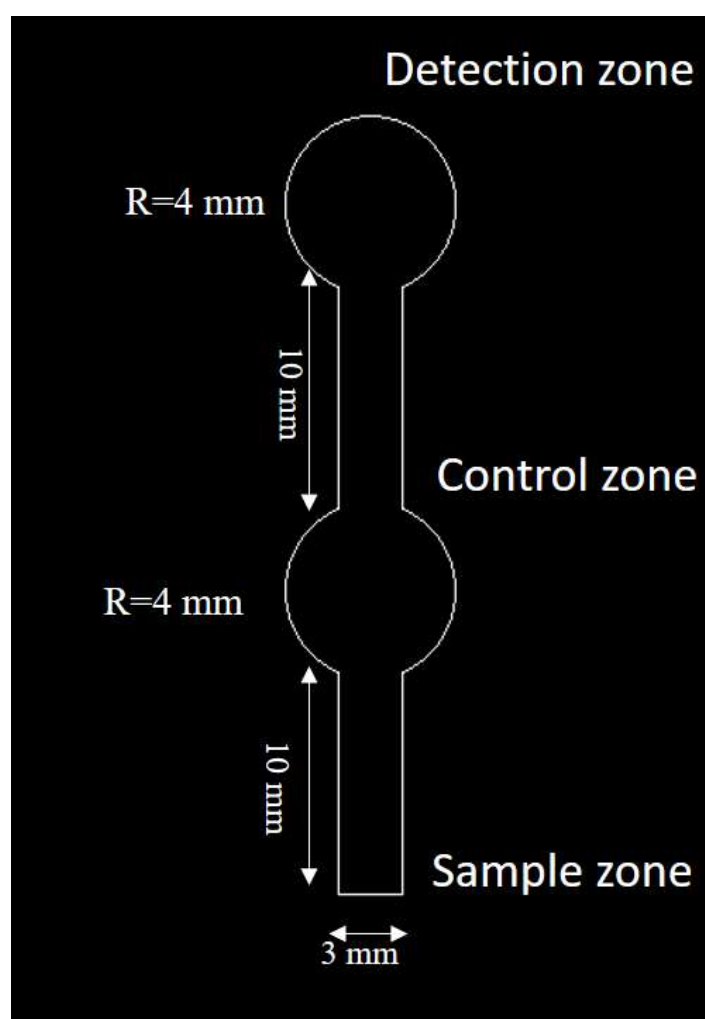


Figure S1. Dipstick platform designed by AutoCAD 2018.

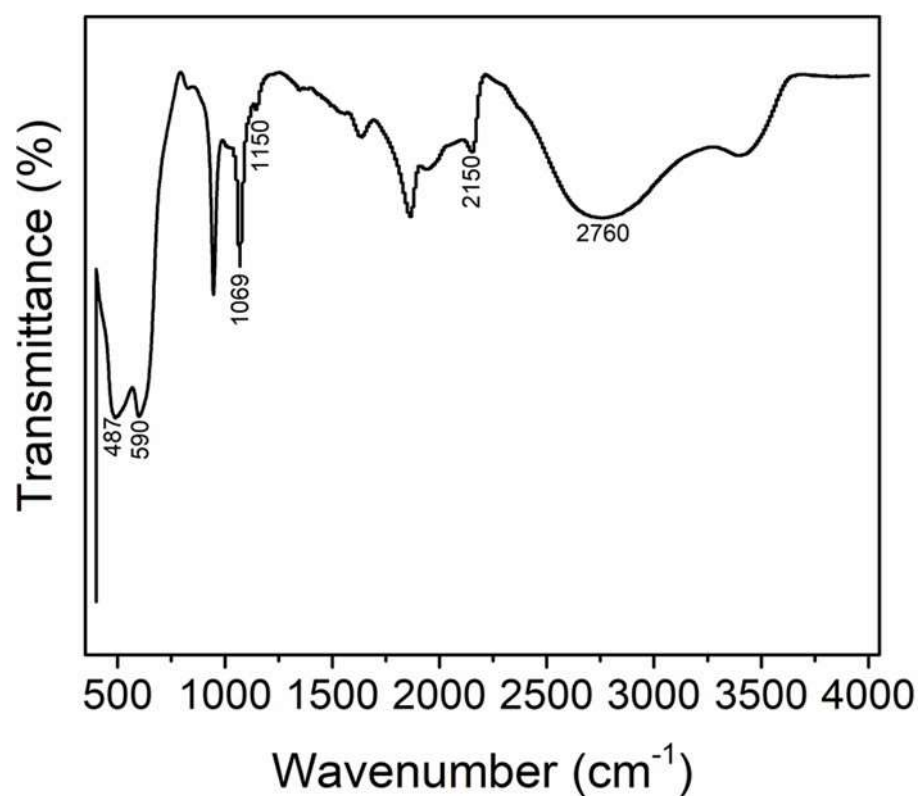
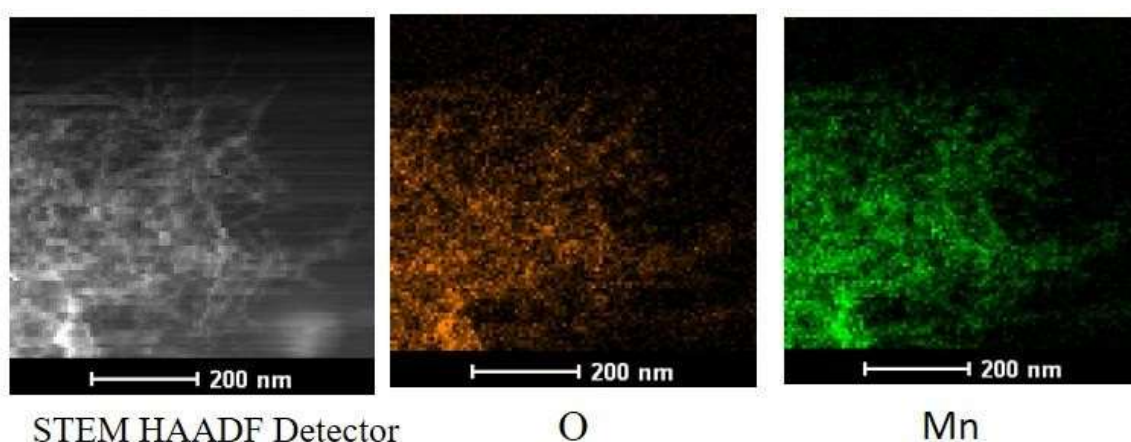


Figure S2. FT-IR spectra of MNWs.



Element	Weight%	Atomic%
O	38.40	68.16
Mn	61.60	31.84
Total	100.00	

Figure S3. EDS maps and corresponding elemental ratios of MNWs.

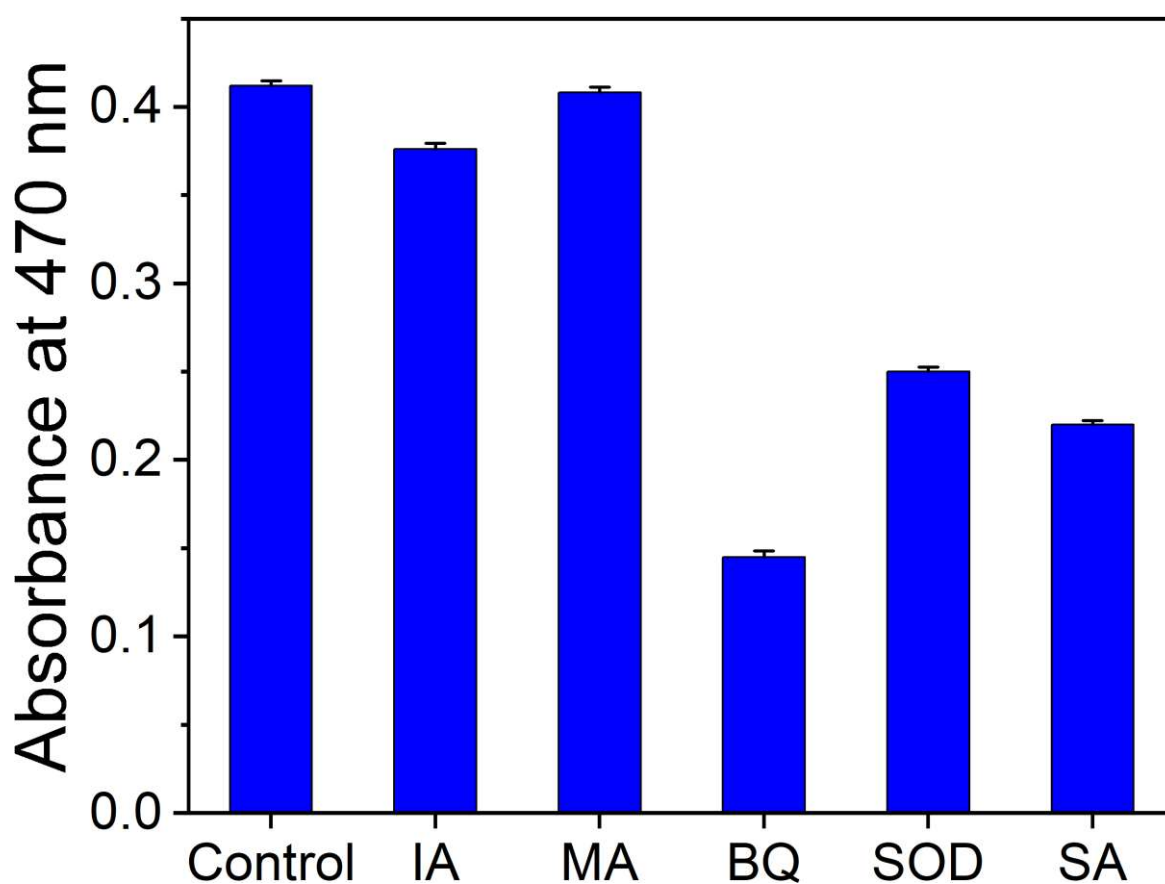


Figure S4. Radical scavenging assay for demonstrating the catalytic mechanism of the dopamine oxidase-like activity of MNWs (IA: isopropyl alcohol, MA: methanol, BQ: Benzoquinone, SOD: superoxide dismutase, SA: sodium azide).

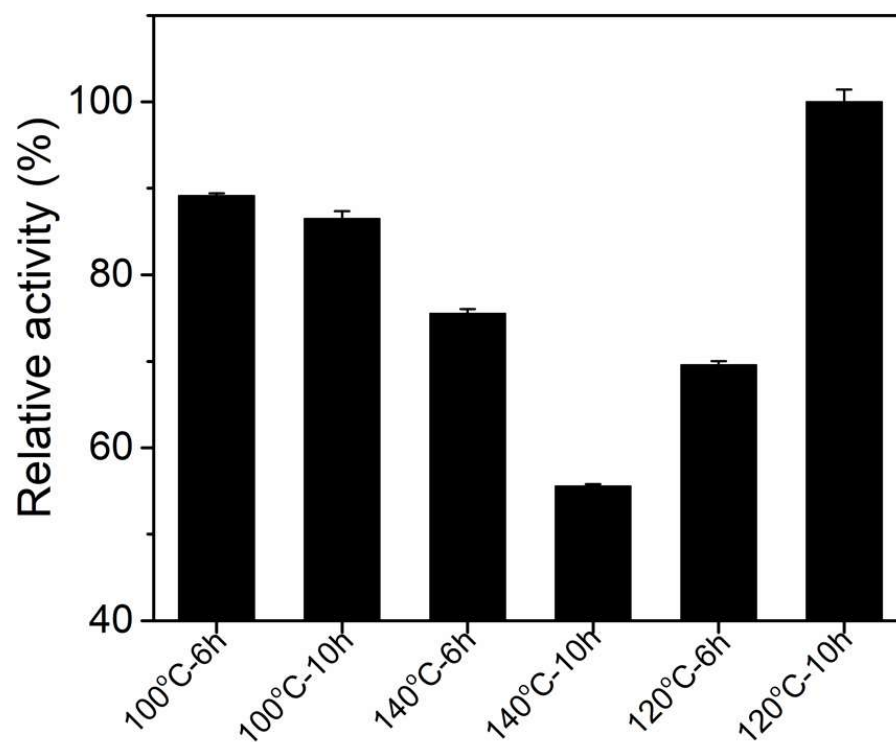


Figure S5. Dopamine oxidase-like activity of MNWs synthesized at diverse reaction conditions.

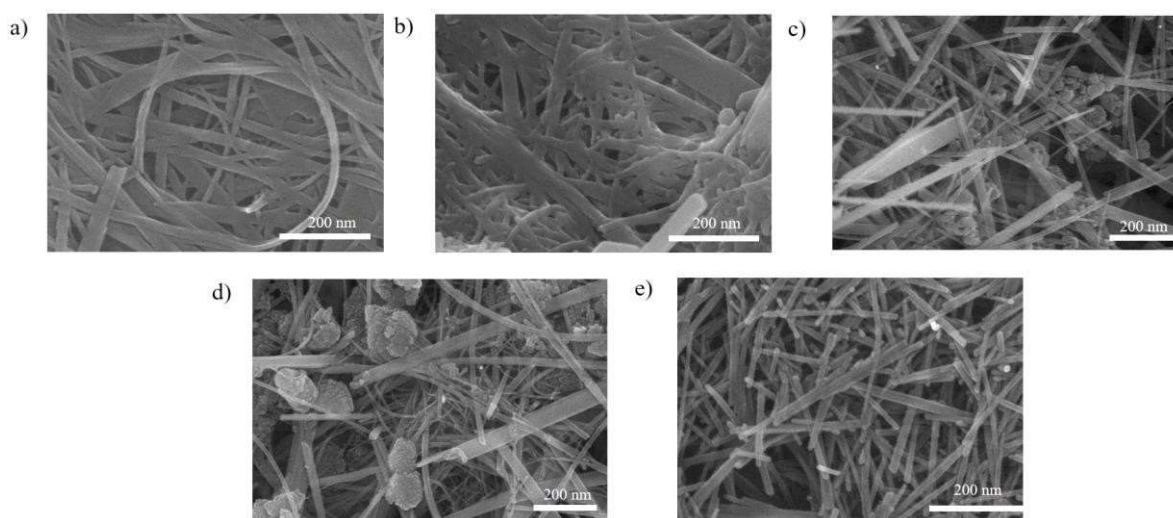


Figure S6. SEM images of MNWs synthesized at a) 100 °C/6 h, b) 100 °C/10 h, c) 140 °C/6 h, d) 140 °C/10 h, and e) 120 °C/6 h.

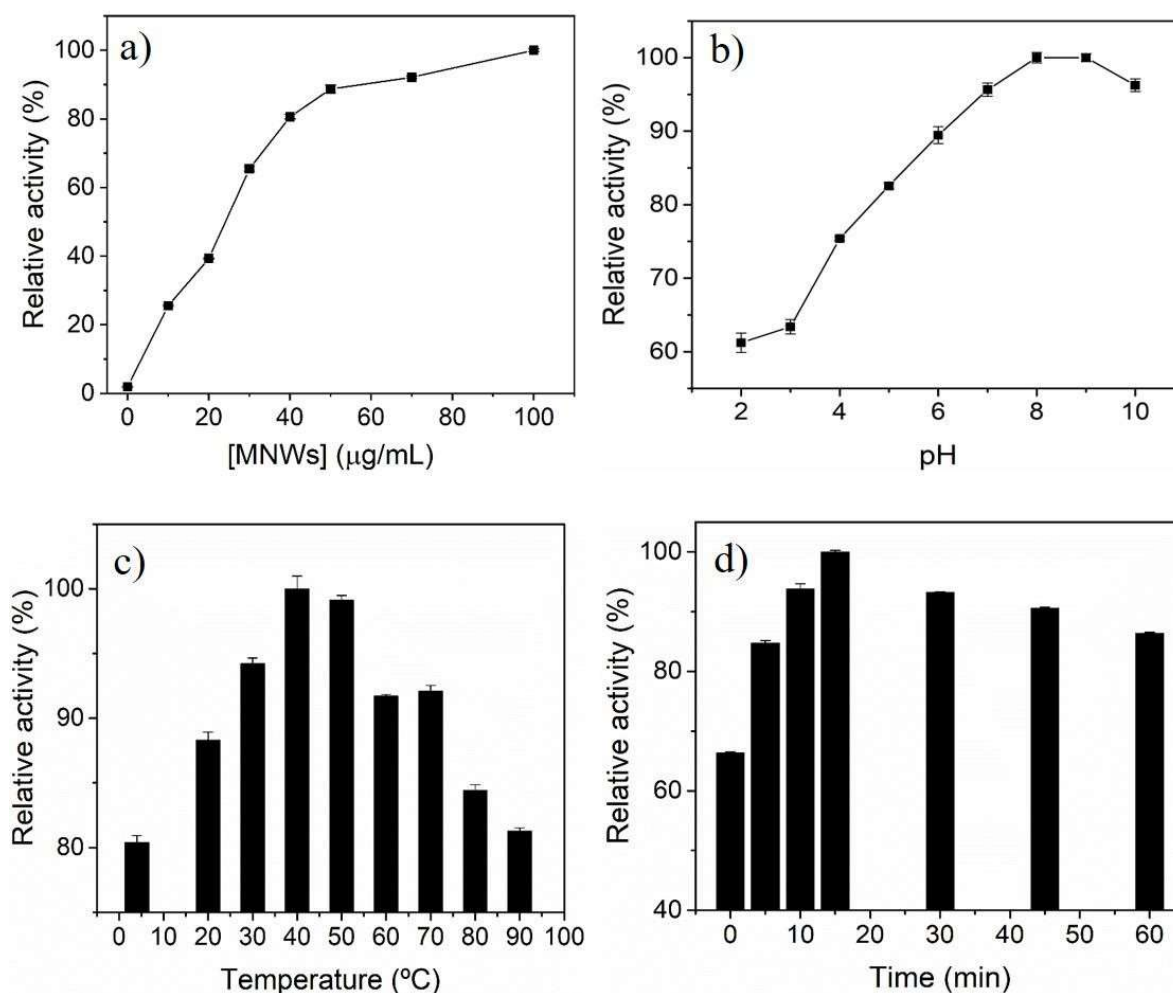


Figure S7. Optimization of a) MNWs concentration, b) pH, c) temperature, and d) reaction time for dopamine oxidase-like activity of MNWs.

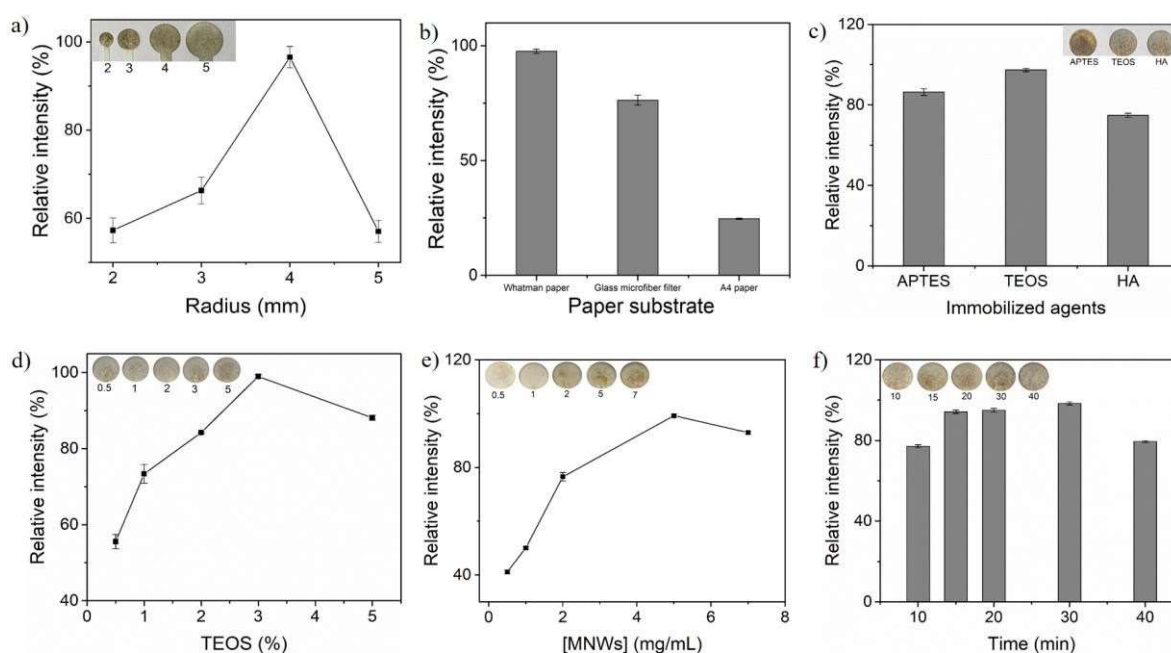


Figure S8. Optimization of MNWs-incorporated dipstick for dopamine detection. a) Radius of detection zone, b) kinds of paper substrate, c) immobilizing agent, d) TEOS concentration, e) MNW concentration, and f) reaction time of the assay.



Figure S9. Time required for an aqueous solution containing crystal violet dye to move through the dipstick.

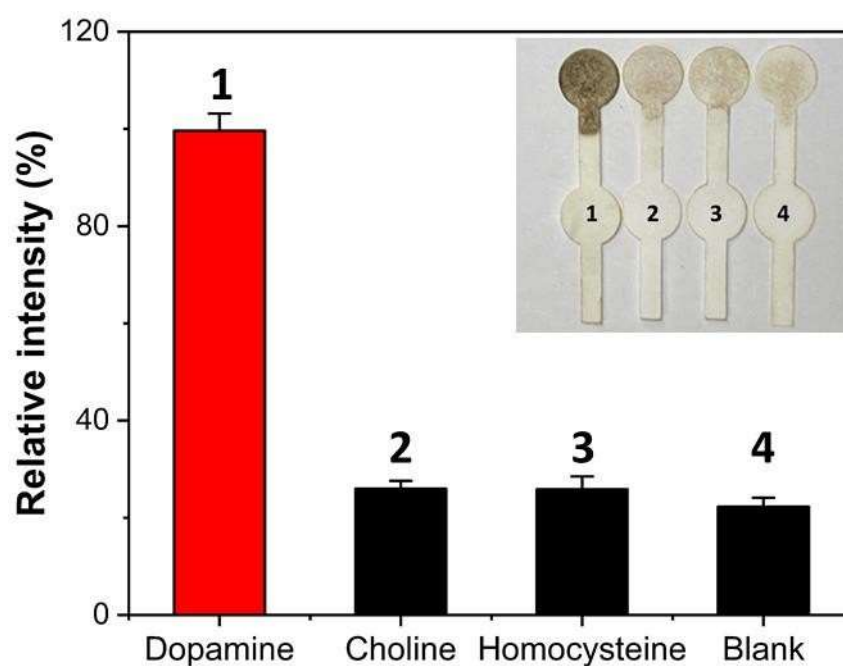


Figure S10. Selectivity toward dopamine via MNWs-incorporated paper dipstick.

Table S1. Comparison of LOD and linear range values of MNWs-containing solution-based assay to detect dopamine, with those of recent reports describing colorimetric dopamine detection.

Methods	Material	Linear range (μM)	LOD (μM)	References
Colorimetry	Pt/hBNNs	2–55	0.76	[16]
Colorimetry	h-CuS NCs	2–150	1.67	[39]
Colorimetry	$\text{Co}_3\text{O}_4/\text{NiO}$	1–1000	1.21	[40]
Colorimetry	Cu-MOXs	0.5–20	0.86	[41]
Colorimetry	MnOOH	3–60	0.70	This work