

Supplementary Information

**Synthesis and Application of Mixed-Spinel Magnesioferrite: Structural,
Vibrational, Magnetic, and Electrochemical Sensing Properties**

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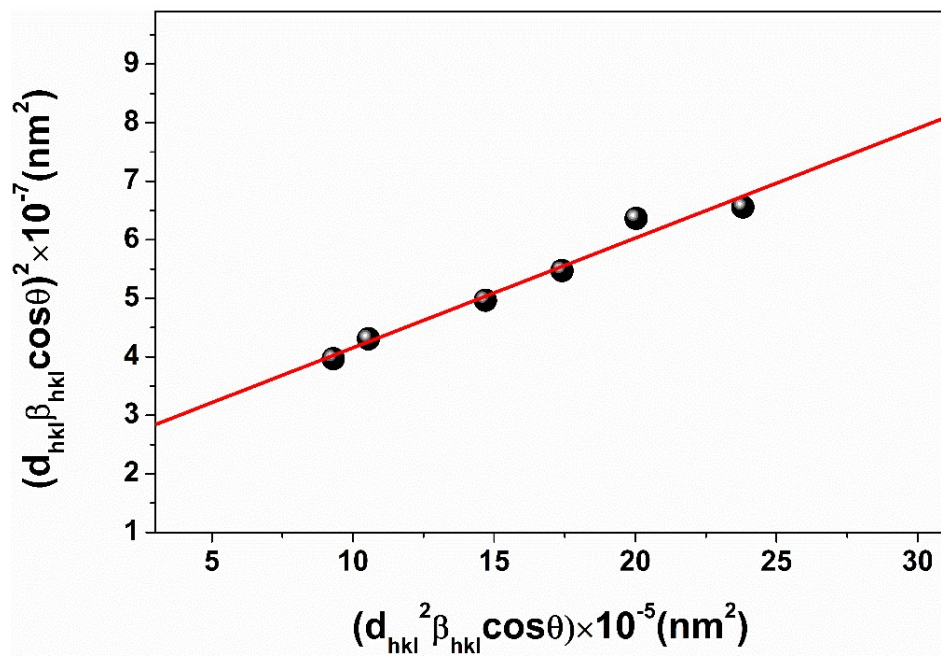


Figure S1: Size-strain plot for MgFe_2O_4 samples. Particle size and micro-strain are deduced from the slope and the square root of the y-axis intercept of the linearly fitted data points

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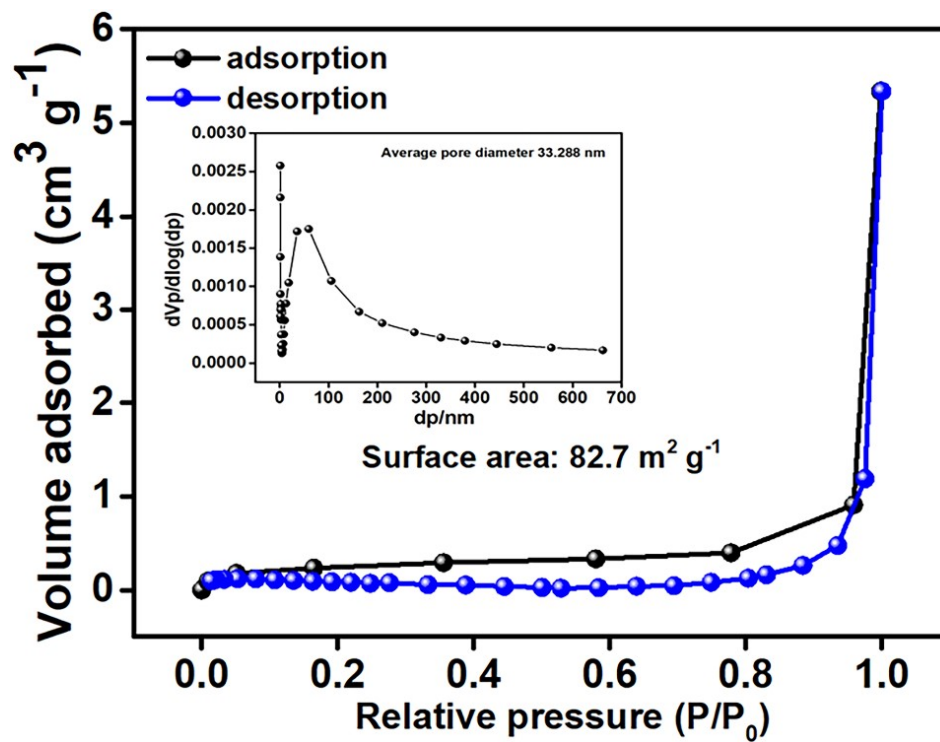


Figure S2: Nitrogen adsorption-desorption isotherm and average pore size distribution curve (inset) of MgFe₂O₄ particles.

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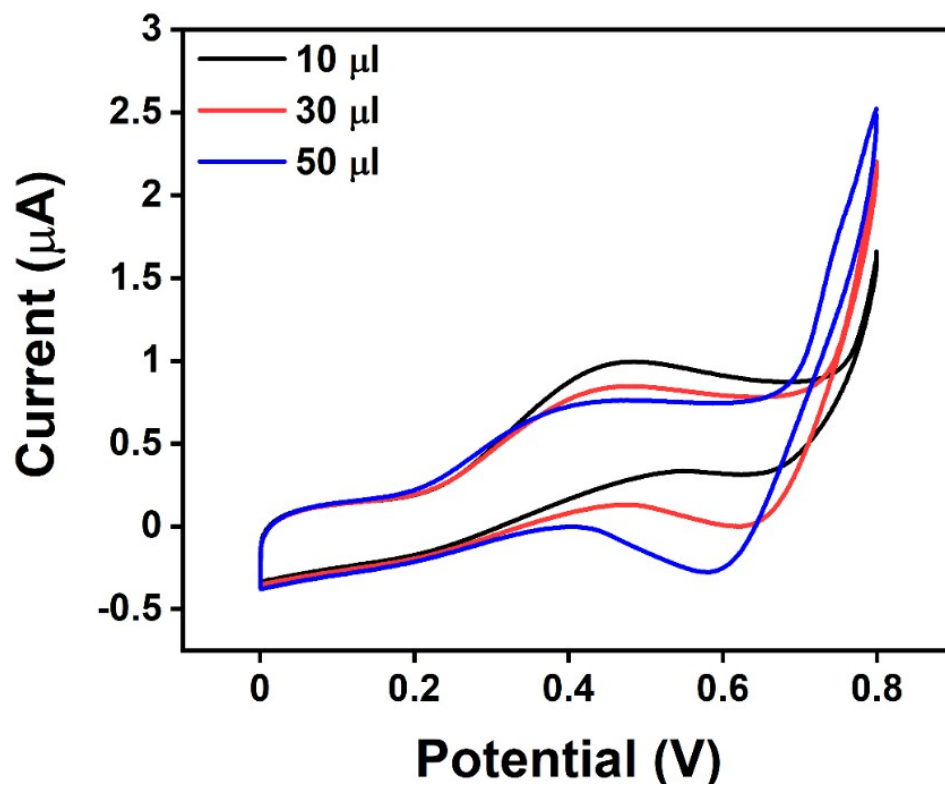


Figure S3: Cyclic voltammetric curves with various concentrations (10, 30, 50μl) of MgFe₂O₄ modified GCE at 0.1 M PBS buffer (pH 7.4) at a scan rate of 50 mV s⁻¹.

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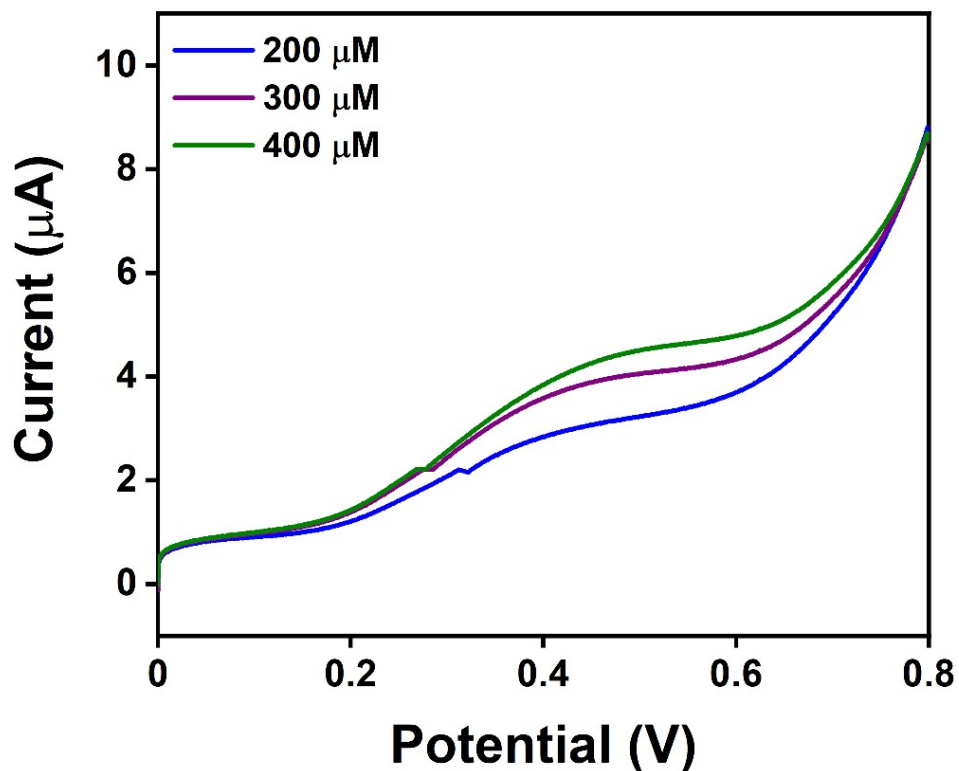


Figure S4: LSV response obtained for MgFe₂O₄ modified GCE in a real sample (orange juice) with the addition of 200, 300, and 400 μM of nitrobenzene at a scan rate of 50 mV s⁻¹.

Table S1: Analytical performance of MgFe₂O₄ modified GCE in real samples

Real Sample	Addition (μM)	Detection (μM)	Recovery (%)
Orange juice	200	6.9	3.45
	300	9.29	3.09
	400	10.33	2.58