

Supplementary data

Selective determination of nitrite in water and food samples using zirconium oxide (ZrO₂)@MWCNTs modified screen printed electrode

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Nitrite detection parameters:

The response time of the CA method for nitrite detection was only 1.2 s.

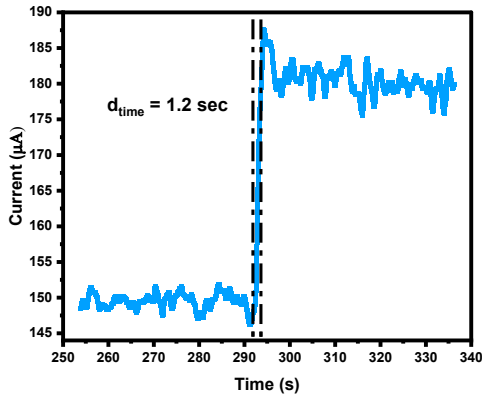


Figure 1S: response time of the CA method

Nitrite calibration range:

Nitrite was detected by chronoamperometry CA method in 0.1 M acetate buffer (pH:4.5) in a wide range from 5 µM to 2.5 mM. The lower range was from 5 µM to 100 µM with the regression $I_{pa} (\mu A) = 0.0349C (\mu M) + 0.0958$, $R^2 = 0.999$, with LOD of 0.94 µM.

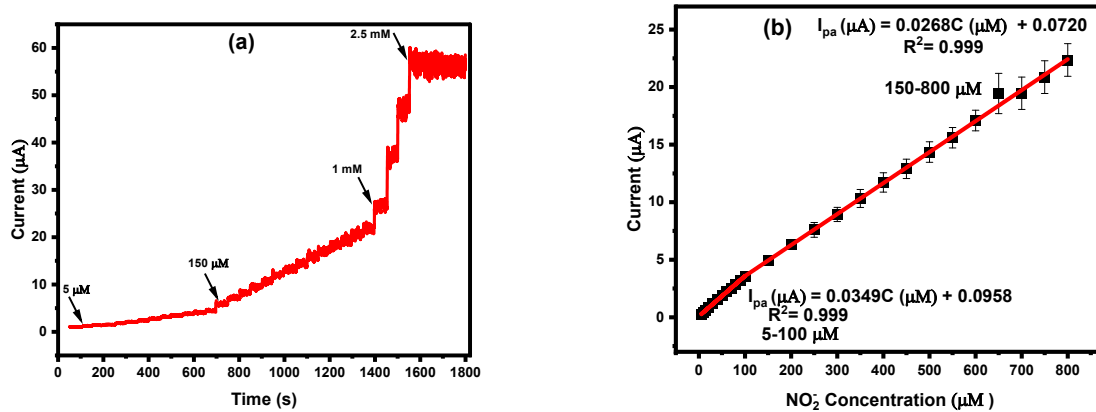


Figure 2S (a): the wide range of nitrite detection (5 µM to 2.5 mM) by CA, (b) the corresponding calibration line

Standard calibration graphs of nitrite (n=3):

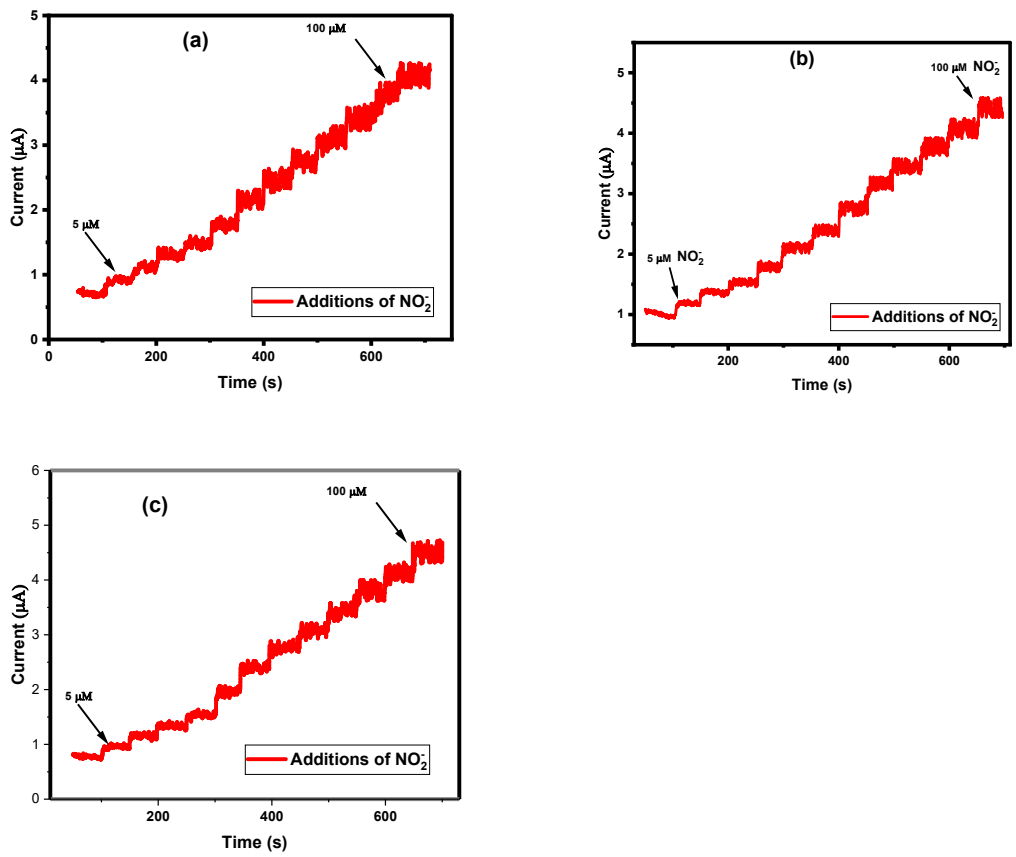
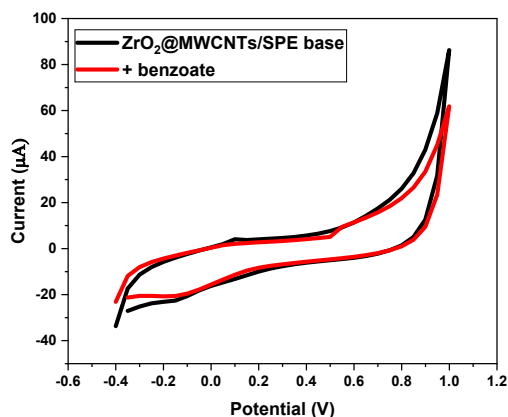
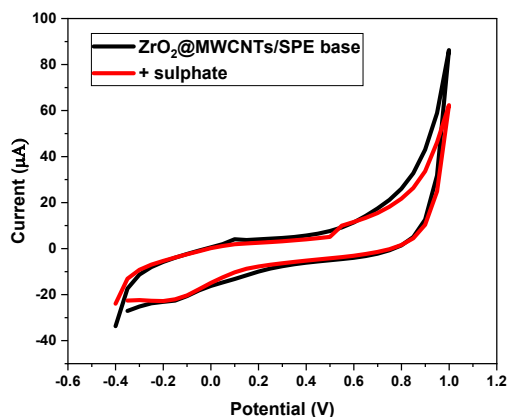
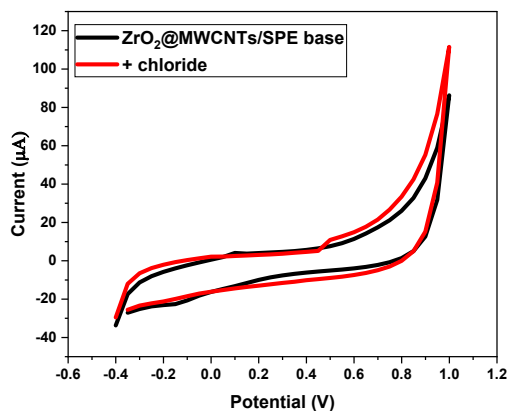
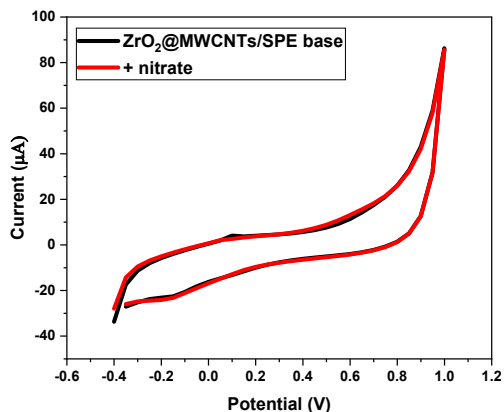


Figure 3S (a, b & c): nitrite calibration graphs by CA (n=3) in 0.1 M acetate buffer (pH:4.5)

Nitrite sensor's selectivity testing:

Cyclic voltammetry CV was used to test the 0.1 M non-targeting analytes individually, in 0.1 M acetate buffer (pH:4.5). No signal appeared from any of the suggested interfering analytes.



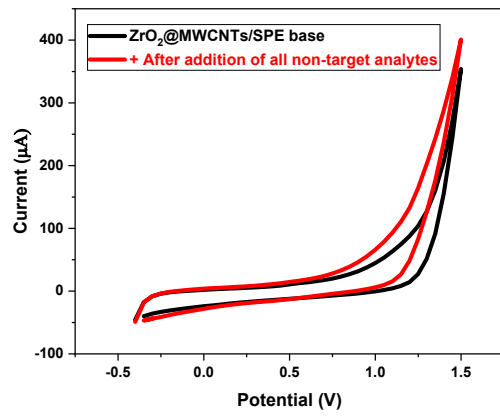
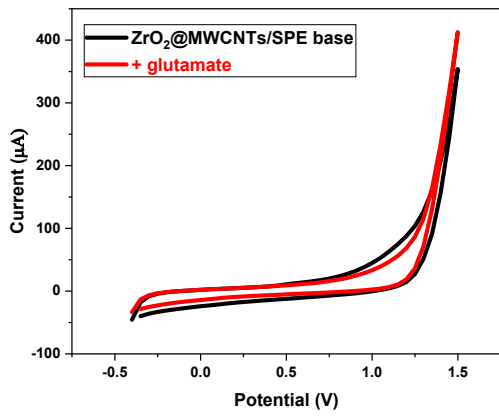
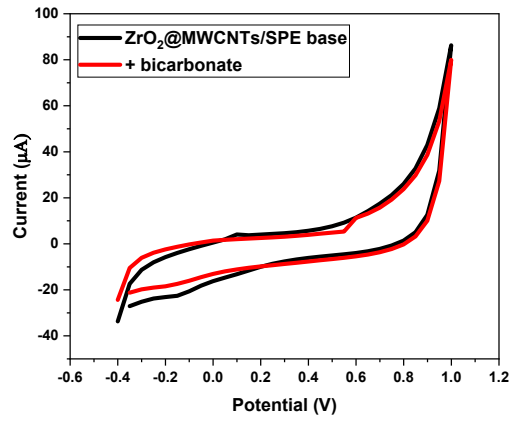
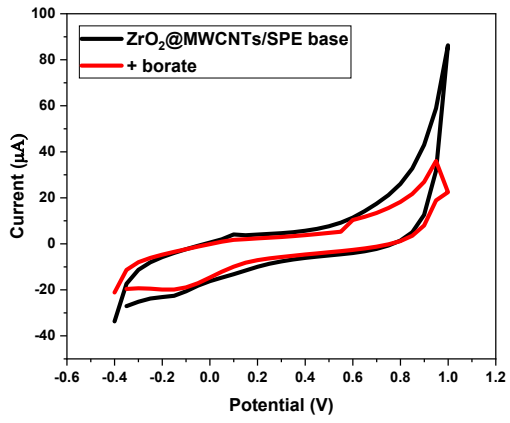


Figure 4S: testing the non-targeting analytes by CV

Testing real samples by Chronoamperometry (CA):

The real samples were tested by the standard addition method to overcome the matrix effect, and to measure the very low concentrations of nitrite, even lower than the sensor's LOD. CA was used at potential of 0.9 V. the samples were spiked with 0.1 M of nitrite the same as the standard nitrite concentration. The detected nitrite was calculated from the difference between the spiked peak and standard peak.

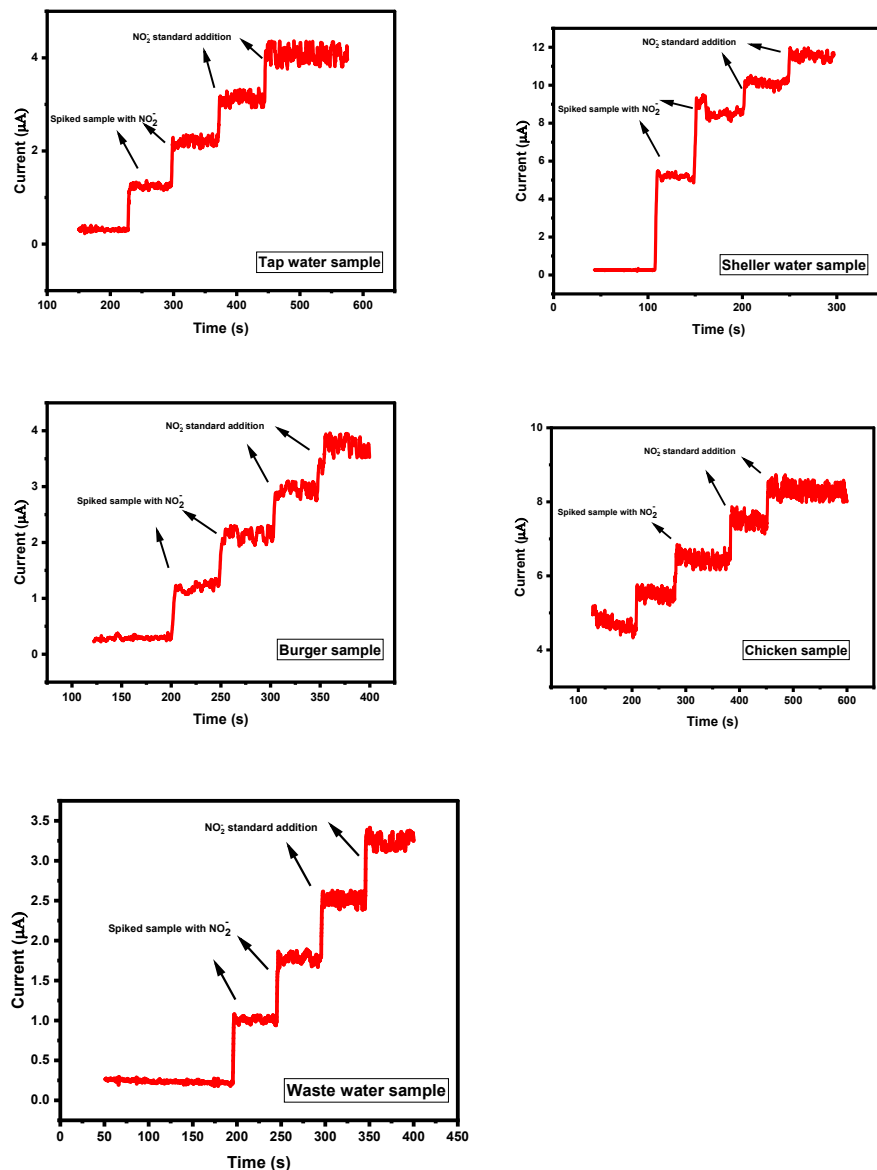


Figure 5S: testing some of the real samples CA graphs, at 0.9 V in 0.1 M acetate buffer (pH:4.5), (n=3)