High-Entropy Ag,Pt-Based Catalyst Toward Exceptionally High-Performance and Stable Electrochemical Detection of Nitrite

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Supporting Information

Experimental Section

1. Materials and Reagents

$Mg(NO_3)_2$ (99.9%), glucose (99.9%), Na_2CO_3 (99.9%), Na_2SO_4 (99.9%), $NaHCO_3$ (99.9%), $CaCl_2$ (99.9%), KCl (99.9%), KNO_2 (99.9%), acetone (99%), ethanol and 5 wt% Nafion solution were supplied by Energy Chemical (Shanghai, China). NaH_2PO_4 (99.9%), Na_2HPO_4 (99.9%), $Fe(acac)_3$ (97%), $Al(acac)_3$ (98%), $Co(acac)_2$ (97%), Ag(acac) (98%), $Pt(acac)_2$ (97%) were obtained from Sigma-Aldrich (Shanghai, China). 0.1 M phosphate buffer (PB) solution was prepared using NaH_2PO_4 and Na_2HPO_4. All these reagents were used as received without further purification and distilled water was used throughout the experiments.

2. Instruments

The microstructure and morphology of high entropy Ag,Pt-based catalyst (FeAlCoAgPt) was observed by Transmission electron microscopy (TEM, FEI-TALOS-F200X operated at 200 kV and equipped with high angle annular dark field (HAADF)). The crystal structures of the samples was analyzed by X-ray powder diffraction (XRD) patterns using XRD-6100 X-ray diffractometer with Cu Kα radiation and diffraction data were collected for 2θ angles ranging from 10◦ to 80◦ at a scan speed of 2◦/min. Nitrite electrochemical detection was performed on CHI660E electrochemical workstation (Shanghai Chenhua Instrument Co., Ltd., China) employing a classical three-electrode electrochemical cell with the catalyst modified glassy carbon electrode (GCE) ($\pi \times 0.15 \times 0.15$ cm^2) as working electrodes, a Pt sheet (10 mm × 10 mm × 0.2 mm) as the counter electrode and a standard Ag/AgCl electrode as the reference electrode, respectively.

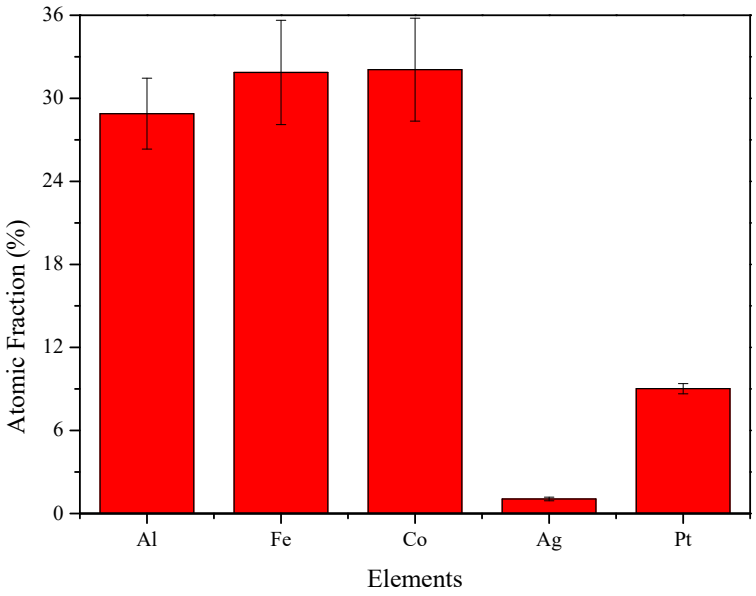

Fig. S1 The atomic fraction results of EDS mapping.[1]

Table S1 The target and measured atomic ratio.

Catalysts	Target atomic ratio (Fe : Al : Co: Ag : Pt)	Measured atomic ratio (Fe : Al : Co: Ag : Pt)
FeAlCoAgPt	0.3 : 0.3 : 0.3 : 0.01 : 0.09	0.29±0.02 : 0.32±0.04 : 0.32±0.03 : 0.01±0.001 : 0.09±0.004

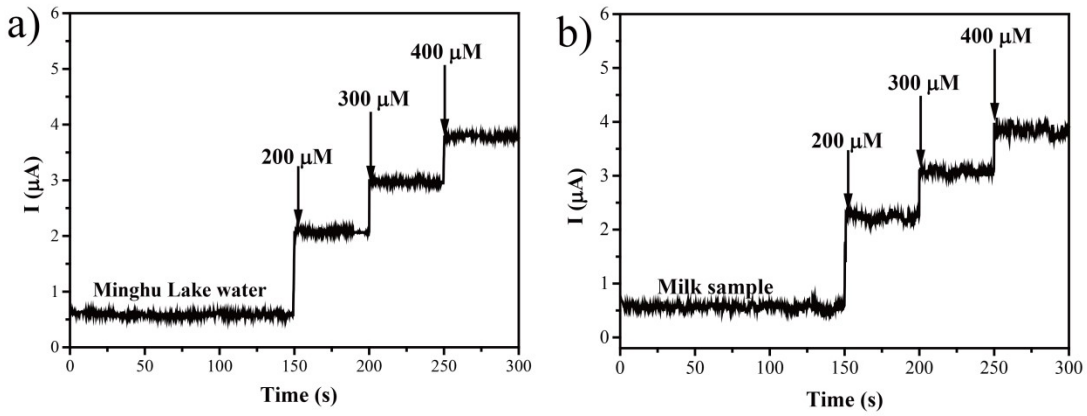

Fig. S2 The amperometric i-t curves of FeAlCoAgPt/GCE for Minghu lake water analysis and milk samples.

Reference

1 Y. Kobayashi, S. Yokoyama, R. Shoji, *Metals.*, 2024, **14**, 443-461.