Supplementary Information

Optimization of the Synergistic Effects in Polycrystalline Pt-Au Electrodes in Developing an Effective Arsenic Sensor via Oxidation Reactions

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Text S1. Stability test

To assess the stability performance of the $(Pt\text{-}Au)_8$ electrode, accelerated CV cycling at a scan rate of 100 mVs^{-1} was carried out for 500 consecutive cycles in a 10 mL 2 mM As(III) solution.

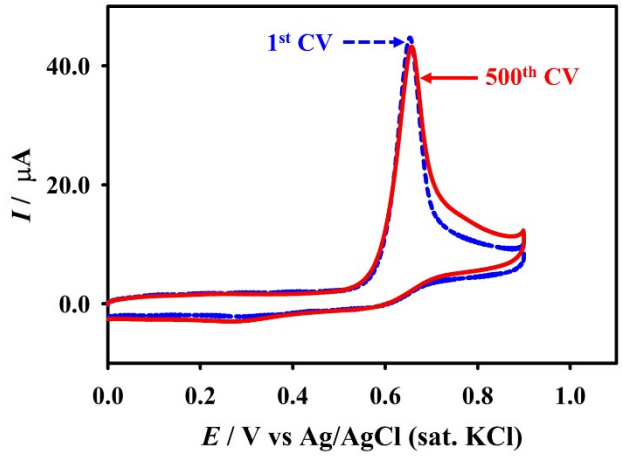

Figure S1. CVs of As(III) oxidation reaction obtained using $(Pt\text{-}Au)_8$ electrode for 2 mM As(III) solution diluted in 0.1 M H_2SO_4 solution during the 1st and 500th potential scanning.

Text S2. Real sample analysis

To prepare real samples for evaluating the electrode's performance, 5 mL of groundwater collected from four different districts in Bangladesh was mixed with 5 mL of 0.1 M H_2SO_4 solution, followed by the addition of 100 µL of 0.1 M As(III) solution, resulting in a final concentration of 1 mM As(III). To assess potential interference from the real matrix, a standard solution was prepared by replacing the groundwater with an equal volume of deionized (DI) water. Linear sweep voltammograms (LSVs) corresponding to the 1 mM As(III) solutions prepared with groundwater of four different districts along with one standard solution are provided below.

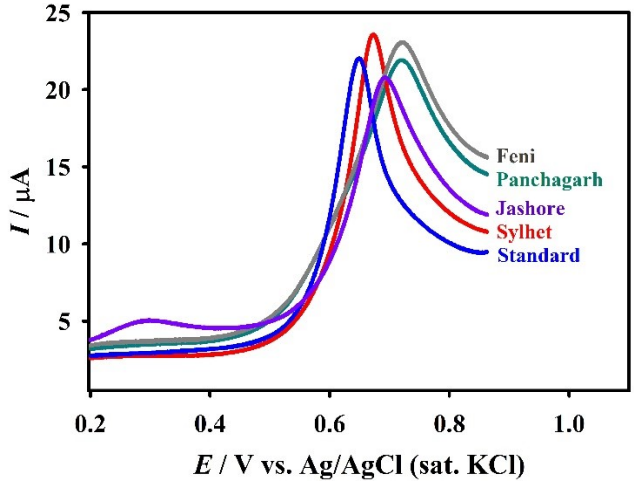

Figure S2. Linear sweep voltammograms (LSVs) obtained for real groundwater samples collected from different districts in Bangladesh recorded using $(Pt\text{-}Au)_8$ electrode at a scan rate of 0.1 Vs^{-1} for 1 mM As(III) solutions.