Electronic Supplementary Material (ESI) for Materials Advances.

Supporting Information

Nanomolar Level Electrochemical Sensing of Explosive Material Sodium Azide, by a Hexagonal Boron Nitride Modified Glassy Carbon Electrode

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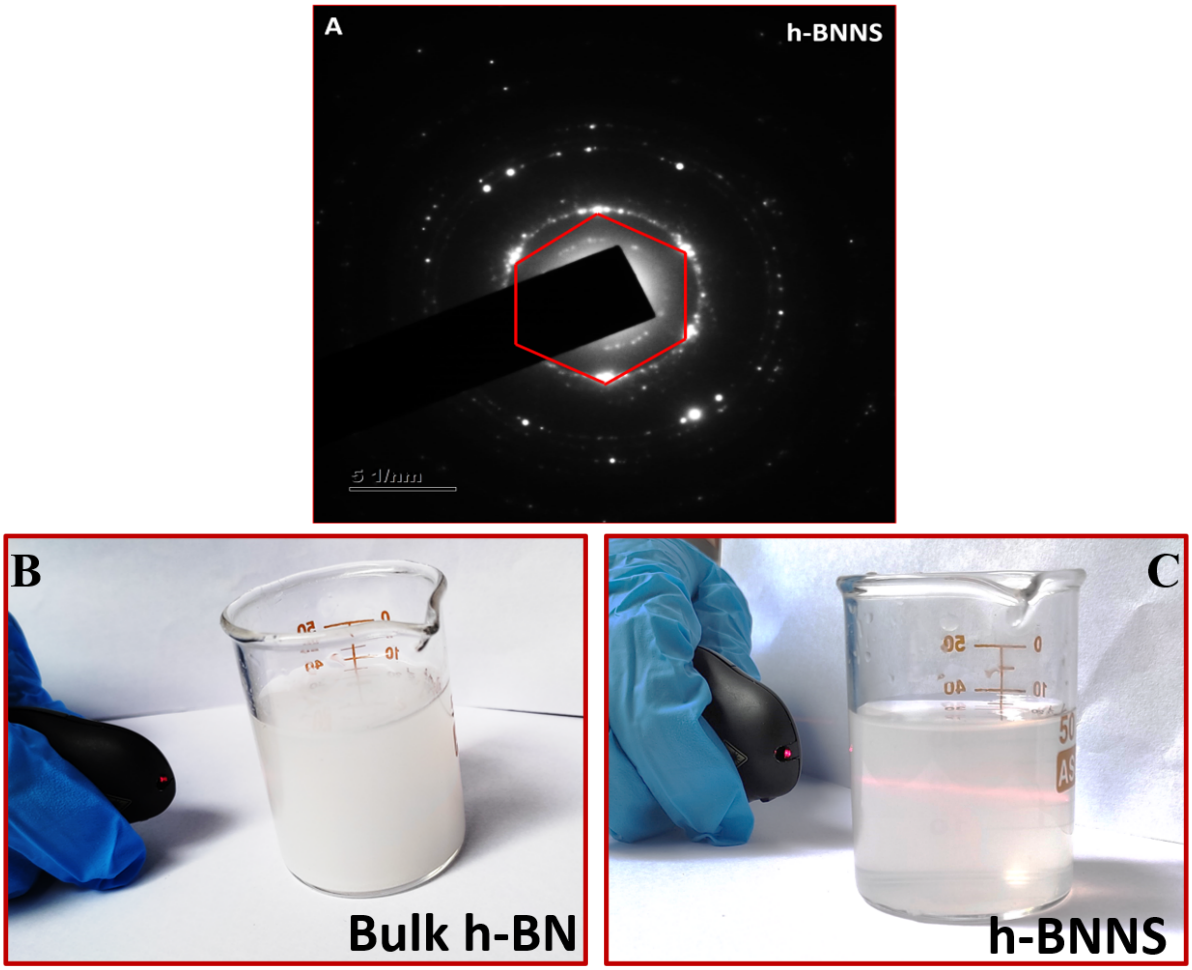

Figure S1: (A): The in-plane high-resolution selected area electron diffraction (SAED) pattern of h-BNNS; and (B-C): the Tyndall experiment performed on bulk h-BN and the h-BNNS dispersions using laser light of wavelength 635 nm

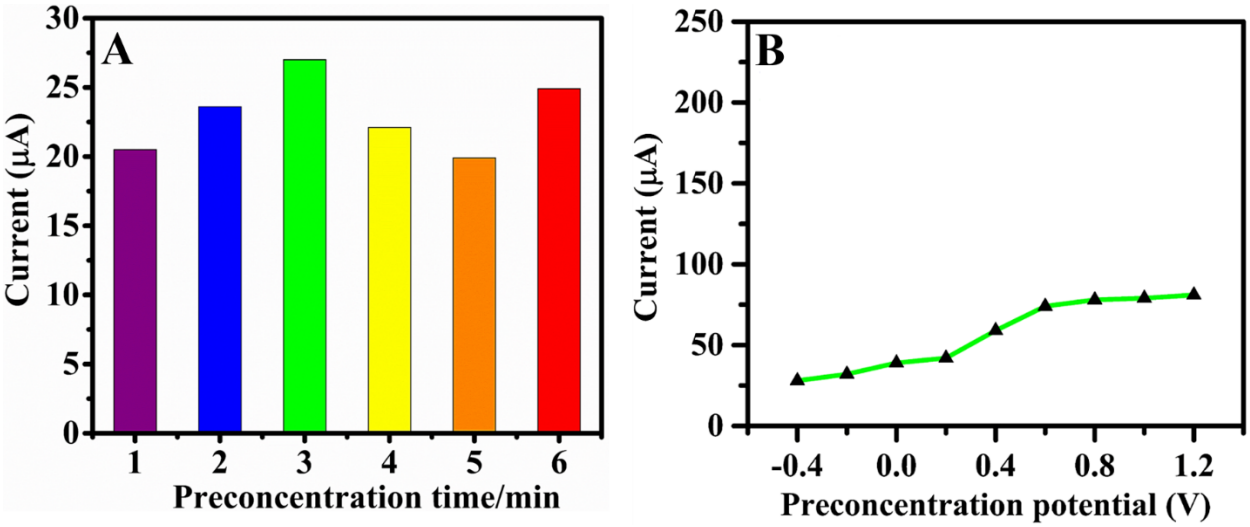

Figure.S2: (A): Effect of preconcentration time on the quantification of 1 mM each SA by h-BNNS/GCE in 0.1 M PBS solution; and (B): Effect of preconcentration potential on the quantification of 1 mM SA by h-BNNS/GCE in 0.1 M PBS solution

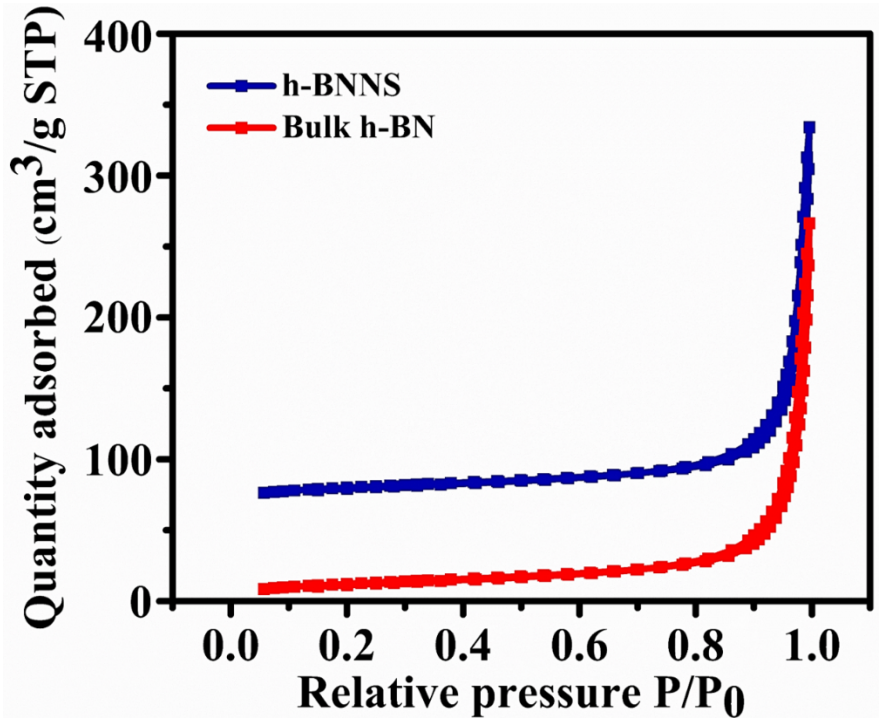

Figure. S3. Nitrogen adsorption and desorption isotherm and Brunauer–Emmett–Teller (BET) surface area of bulk h-BN and h-BNNS.

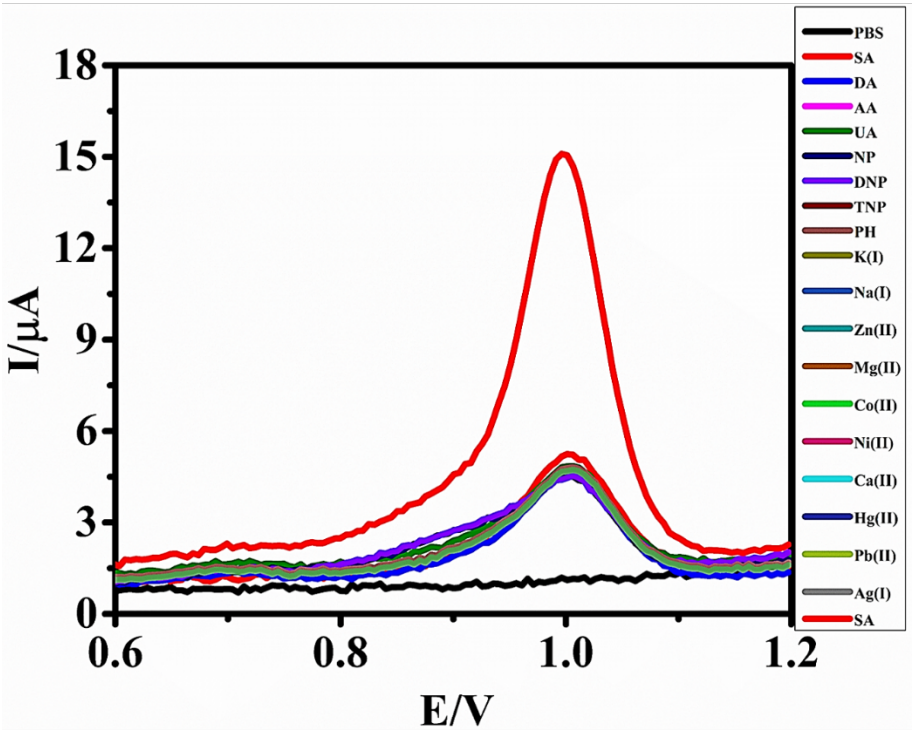

Figure. S4: The DPV scans showing the interference studies of h-BNNS/GCE for the detection of 1 nM SA in the presence of other biomolecules, toxic contaminants, and metal ions each of 1 μM concentration.

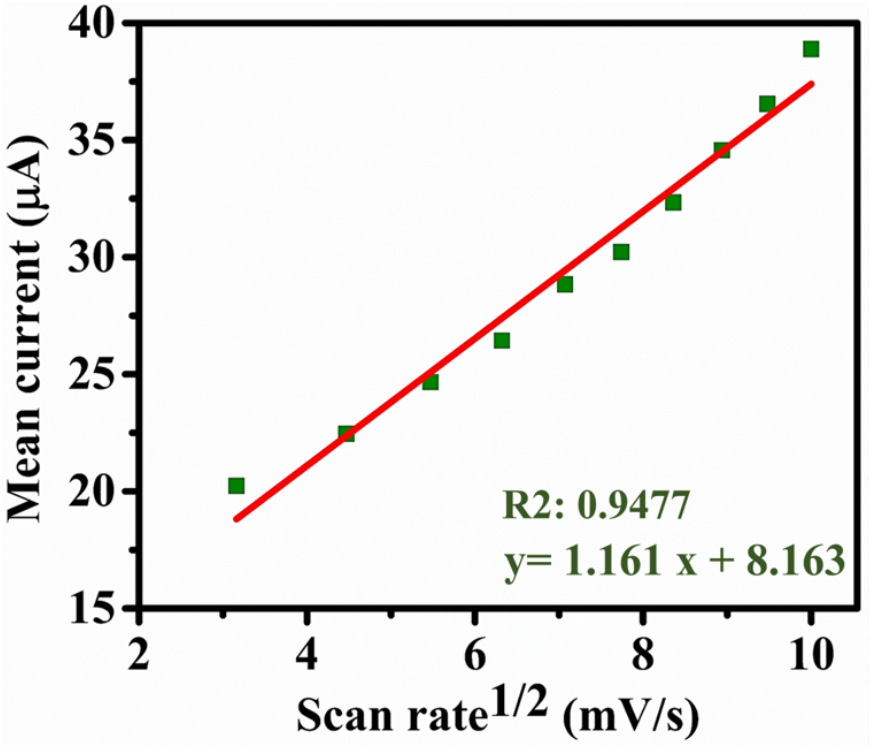

Figure S5: Calibration plots of anodic peak current Vs. the square root of scan rates.

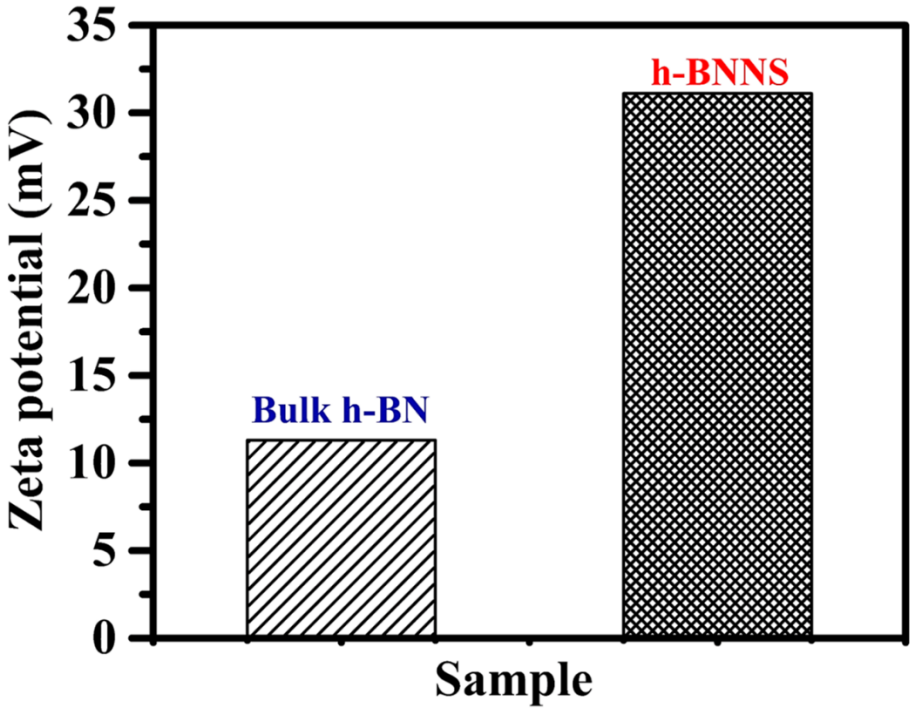

Figure. S6. Zeta potentials of bulk h-BN and h-BNNS.

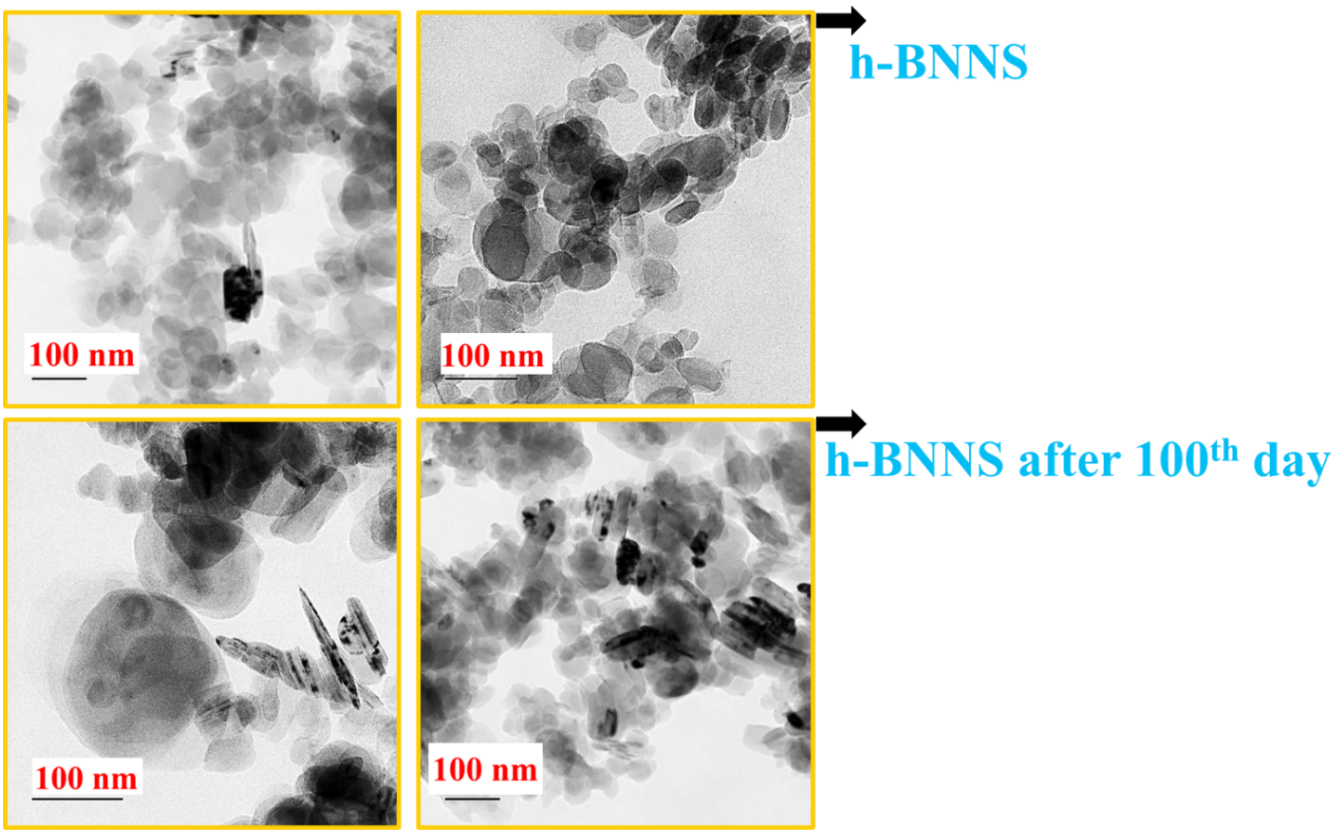

Figure. S7: The TEM images of h-BNNS after 100 days

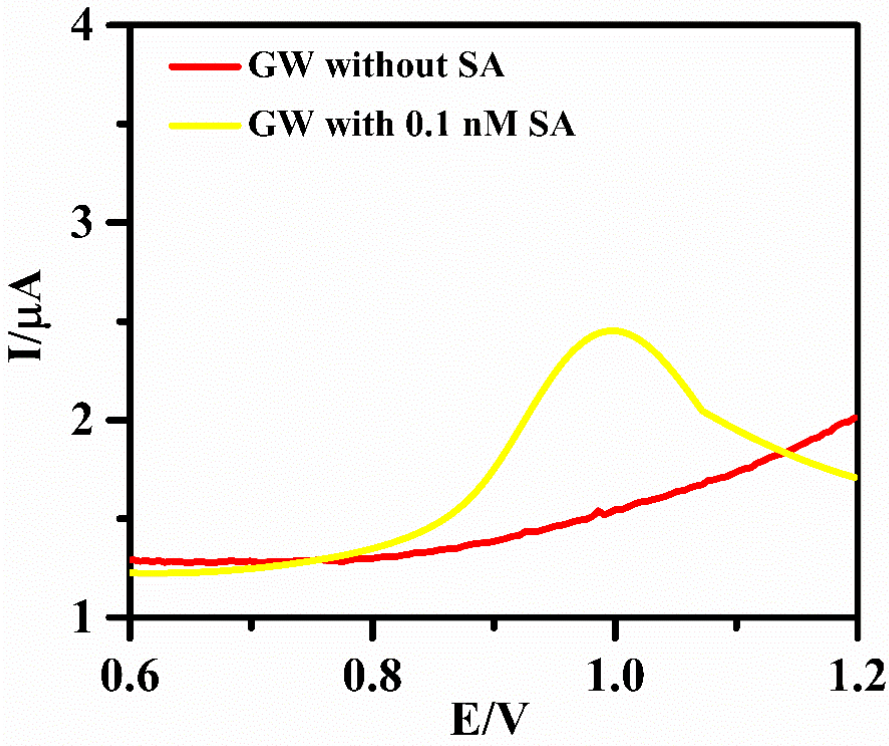

Figure S8: The DPV curves showing the LOD of 0.1 nM of SA obtained in GW as the electrolyte

Preparation of electrolyte

The 0.1 M PBS buffer solution with pH 7 was prepared by mixing of standard stock solutions of 0.1 M sodiumdihydrogen phosphate monohydrate (M=137.99 g/mol, 3.45g in 250 ml) and 0.1 M disodiumhydrogen phosphate dehydrate (M=178.00 g/mol, 4.45 g in 250 ml) in suitable amounts.

Sensitivity Calculation

The sensitivity of an electrode depends on the current response, concentration of the analyte and also the area of the electrode used. They are related as,

$$Sensitivity = \frac{Current\ response}{Concentration\ of\ analyte * Area\ of\ electrode}$$

LOD Calculation

$$LOD = \frac{3\sigma}{m}$$

σ- The standard deviation of the current responses of blank

m- Slope of Current vs Concentration graph