Polyaniline/Ba bismuthate Nanobelts for Sensitive Electrochemical Detection of Tartaric Acid

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An *in-situ* polymerization route has been applied to obtain polyaniline/Ba bismuthate nanobelt (PAN/BBN) composites with different polyaniline mass percentage. The PAN/BBN composites were characterized by X-ray diffraction (XRD), transmission electron microscopy (TEM), high-resolution TEM (HRTEM) and electrochemical cyclic voltammetry (CV) method. XRD shows that the obtained composites are composed of monoclinic BaBiO_{2.5} phase. Transmission electron microscopy observations show that the amorphous polyaniline particles with the size of less than 100 nm attach to the surface of the Ba bismuthate nanobelts. The PAN/BBN composites modified glassy carbon electrode (GCE) exhibits good electro-catalytic activity toward tartaric acid (TA). A pair of quasi-reversible CV peaks are located at -0.69 V and +0.49 V, respectively. The negative shift and increase in the current show that the PAN/BBN composites modified GCE has enhanced electro-catalytic activity toward TA. The influence of the scan rate and electrolyte on the electrochemical responses has also been researched. The limit of detection (LOD) decreases from 0.12 μ M to 0.08 μ M with increasing the polyaniline mass percentage from 10% to 40%. The PAN/BBN composites modified GCE shows good stability and reproducibility.

Keywords: Ba bismuthate nanobelts, Polyaniline, Transmission electron microscopy, Electrochemical detection, Tartaric acid.

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