Ammonia Oxidation on the Barium Doped Nano Structured PbO₂ Electrode: An Electrochemical Preparation and Application

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In the present investigation, we report a novel nano structured Ba/PbO₂ prepared by electrochemical deposition method has been employed for the effective oxidation of ammonia in aqueous solutions. The electrode deposition was achieved in the boric acid bath solution that yielded a smooth deposition of PbO₂ without poisoning the supporting electrolyte. The surface characterization of the deposited layer was done using Scanning Electron Microscope (SEM), and observed that cauliflower like morphology of undoped PbO₂ was completely changed to a sharp edge like flower shape morphology due to the addition of Barium ions. The XRD characterization showed that nano crystallinity of PbO₂ gets altered with the concentration of the Barium (Ba) ion dopant. Cyclic voltammetric investigation indicated that Ba₁₀₋₅/PbO₂ electrode effectively oxidized Ammonia (NH₃) in alkaline solution, as confirmed through FT-IR spectral analyses. The prepared Ba containing electrode layer is quite promising for the oxidization of Ammonia for various industrial applications.

Keywords: Electro-deposition, Nano structure, Barium doped PbO₂, Ammonia oxidation.

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