

Electrochemical synthesis of Ba/PbO₂ electrode for sensor applications

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Controlling the dissolution of positive lead dioxide is a challenging factor to increase its life time. To overcome this problem, many metal ions are incorporated along with PbO₂. In this way group (IIA) metal series to be considered as a significant dopant to stabilize the positive material. Thus, Pb-Ca, Pb-Ba, and Pb-Sr-Ba alloys are commercially available for the real application. Among them, Ba metal shown enhanced electrode hardness and stability. No such material has been used in sensor application except few report on gas sensor in particularly NO_x. Herein, the Ba/PbO₂ electrode electrochemically prepared and utilized as NH₃ sensor. At first, current density and concentration of precursor of Barium and Lead varied especially, concentration ratio between Pb to Ba has considered. All the electro-deposition done at 65 °C in 0.2 M H₃BO₃. The as prepared electrodes examined through SEM and XRD analyses. Further, the prepared electrode was subjected to determination NH₃ through cyclic voltammetry technique in various pH solutions.