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Hydrogen Evolution at Platinum (Pt) and at Platinized Platinum (Ptz) Cathodes

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**Abstract:** In this study, the cathodic behaviours of bright platinum (Pt) and at platinized platinum (Ptz) on the platinum anode were investigated in a 1M Na<sub>2</sub>SO<sub>4</sub> electrolyte (pH, from 2 to 8) by means of electrolysis. The theoretical ( $\Delta E_{rev}$ ) and experimental ( $\Delta E_{exp}$ ) discharge potentials and the cathodic overpotentials ( $\eta_c$ ) of the systems were determined. The amounts of hydrogen gas produced at different times on the cathodes at a constant potential (5V) were measured and the hydrogen yield was calculated. The resulting scheme has been very helpful to obtain modified electrocatalytic coating and electrode structures at Ptz cathode, able to operate for long time with good and stable performances.

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