PREPARATION OF PLATINUM MODIFIED CATHODE MATERIALS FOR ALKALINE WATER ELECTROLYSIS

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A thin Ni underlayer (CuNi) and following a NiZn top layer was deposited electrochemically on a copper specimen (Cu/Ni/NiZn). Then, the Cu/Ni/NiZn electrode was exposed to 30% NaOH solution and Zn was leached out to produce a porous surface. The alkaline leached Cu/Ni/NiZn electrode was finally modified by deposition of 1 mg cm⁻² Pt (Cu/Ni/NiZn-Pt). The prepared electrodes were tested as cathode materials for alkaline water electrolysis. Electrochemical tests showed that the deposition of small amount of Pt over the alkaline leached Ni/NiZn thin layer could lowers the overpotential of hydrogen evolution reaction and improves markedly the hydrogen evolution activity of Cu/Ni/NiZn electrode. More hydrogen gas volume was produced at the platinum modified electrode in comparison to that of Cu/Ni/NiZn. The high hydrogen evolution activity of Cu/Ni/NiZn-Pt electrode was related to the high surface area, good intrinsic catalytic activity of Pt and the synergistic interaction between the metals [1, 2].

Figure 1. Current-potential curves of copper (●), Cu/Ni/NiZn (■) and Cu/Ni/NiZn-Pt (▲) electrodes obtained in 1 M KOH solution.

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References