A Study on Zinc-Platinum Battery

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ABSTRACT

Batteries are devices that transform chemical energy into electrical energy. Because of the portability, they are widely applied in various fields. This research focus on analyzing the performance of homemade Zinc-Platinum Batteries by using Arbin full cell test Instruments. During the process of experiments, the proportions and formula of KOH and NH4Cl in the electrolyte solutions are altered to change the distance between the positive electrode and the negative electrode as well as the amount of the current load. By calculating the consuming amount of zinc electrode, we observe the amount of hydrogen produced on the electrode. The results of the experiments indicate that the maximum current a Zinc- Platinum Battery can offer is 1400mA and the current density 166mA/cm2。The concentration of KOH and NH4Cl is in proportion to the battery performance. The best proportion of the electrolyte solutions is when the concentration of KOH reaches 3M, NH4Cl 6M. The distance of between the positive electrode and the negative electrode shows an inverse proportion to the performance. The load of the battery also shows an inverse proportion to the hydrogen amount produced on the electrode. The effectiveness of NH4Cl working to repress zinc corrosion indicates a direction proportion to its concentration. When the concentration of NH4Cl reaches over 5M, it makes poor performance of the battery. The development of a Zinc- Platinum Battery is still at the beginning stage. Its performance is between an Alkaline Battery and Carbon Zinc Battery. It is our hope that with this research, more interests will be aroused and more studies will be conducted to make Zinc-Platinum Batteries meet the highly demanded electricity of 3C products and become popular in the market.

Keywords : Battery ; NH4Cl ; KOH ; electrolyte ; electrode ; zinc corrosion

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