

Study of the Air-Flow Management of the Zinc-Air Cell

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ABSTRACT

This study intends to investigate air flow management of zinc-air cell. Zinc-air cell is a kind of electrochemical batteries that could be taken as air-depolarized cell. Its development is even earlier than fuel cell. Zinc-air cell, developed in the eighteenth century, is different from alkaline electrolyte zinc-air cell today. Zinc-air cell was used NH_4Cl acidity electrolyte at that time. Moreover, in the eighteenth century, the anode was zinc and the cathode was carbon combining with platinum. The device contained only small current density so that it can not generate electric power capability. Today, zinc-air cell is developed quickly due to the gas electrode and pore structure material technology. Air is very important for zinc-air cell, and would decrease cell performance while the cathode does not have enough gas. Carbon dioxide, one of the air component, would react with alkaline electrolyte and become a carbonate compound. Carbonate compound would affect electrolyte performance. This research will apply fan to produce flow and compression gas and examine how the different air flow management method will led to different cell performance. The experiment method will be galvanostatic method, a kind of voltammetry. It will use different wind velocity and gas pressure for operation parameters during cell discharge. Besides, humidity are also very important effects for cell performance. In a word, performance operation surrender parameters and air flow management method are presented in this research.

Keywords : Zinc-air cell ; Air flow management ; Compression gas ; Galvanostatic method ; Voltammetry

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