

CHARACTERIZATION OF ELECTROLESS NICKEL DOPED ELECTROLYTIC MANGANESE DIOXIDE

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ABSTRACT

Electrolytic manganese dioxide (EMD) is a major component of the composite cathode for the rechargeable alkaline manganese (RAM™) cells. Attempts have been made by many researchers to further improve the rechargeability of the EMD for this application. In this work, EMD was doped with nickel via electroless plating technique. This technique requires EMD to be immersed in a plating solution of sodium hypophosphite and sodium pyrophosphate as the reducing agent, nickel sulphate as the nickel source and tin chloride as a sensitizing agent. The reaction was catalysed by palladium chloride in an ultrasonic bath. From the Energy Dispersive X-Ray analysis, it was found that 10-30 % of nickel was successfully coated. However the percentage of nickel coated depends greatly upon the concentration of chemicals in the plating solution. The electrical conductivity was studied using the van der Pauw method. It was found that the conductivity was influenced by the presence of phosphorus in the nickel-doped EMD samples.

<http://journal.masshp.net/wp-content/uploads/Journal/2004/Madzlan%20Aziz%20144-149.pdf>

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