Corrosion Control by additive in film-type manganese battery

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A manganese dioxide (MnO_2) layer and zinc (Zn) layer are used as the cathode and the anode to develop film-type manganese batteries in which a stack of a MnO2 layer, gel electrolyte and Zn layer sandwiched between two plastic layers. The finding in this paper discuss the problem of swelling upon storage due to evolution of gases and these impose pressure which leads to layer separation. Most of report used small amount of mercury, which is useful in the prevention of hydrogen formation during better operation; however, it has several environmental hazard. In this work, calcium hydroxide was used as an additive in electrolyte of film-type manganese batteries to prevent evolution of gases very effective. The components of electrolyte were investigated by means of ICP and the volume of gases was investigated by volumetric method. The gases volume generated in film-type manganese batteries were about 27㎖/g-zinc and 15㎖/g-zinc when the concentration of Ca in electrolyte was 100ppm and 230ppm, respectively.