Electrochemical behavior of polyaniline in chloride/citrate electrolyte

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INTRODUCTION

Among large number of ECP, polyaniline (PANI) is the most investigated as cathode material in aqueous based electrochemical power sources. Although systems consisted of PANI cathode combined to electronegative metal (mainly zinc) anode, are likely to accomplish most of the three E criteria: Energy (high energy content with respect to volume and weight), Economics (low manufacturing and maintenance costs, long service life), Environment (toxic free, safety, low energy consumption, easy to recycle) elaborated as the determining factors of an electrochemical power system success they still have not been commercialized from several reasons. First reason is related to the fact that PANI is degradable at potentials more positive than 0.5 V, while the main reason is connected to zinc dendrite and solid phase formation during charge/discharge cycles in common chloride based electrolytes, affecting columbic efficacy and cycle life. It was shown previously that addition of citrate anions in chloride electrolyte had resulted in lowering of zinc dendrite formation and corrosion rate. Hence, the aim of this paper was to investigate the influence of citrate anions on characteristic of electrochemically synthesized PANI electrode for potential use in electrochemical power sources.

RESULTS AND DISCUSSION

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