Studies of Zn-poly(aniline-co-5-aminosalicylic acid) Aqueous Battery with Graphite Paper Current Collector

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Zn- PANI aqueous electrolyte secondary batteries have many advantages, such as low price and free of pollution, but some shortcomings still exist, for example, over-charge electrochemical degradation of the PANI, Zn passivation and Zn dendrite, especially current collector of PANI electrode is corroded easily. So far, how to overcome the many inherent questions of Zn- PANI secondary batteries is still a hot topic. Herein, an efficient strategy is proposed by increasing the electroactivity of current collector by potentiostatic deposition of poly (aniline-co-5-aminosalicylic acid) (PAASA) on graphite paper (PG, an excellent corrosion-resistant, low-cost, good conductivity, soft, elastic and light material) for collecting current. To study the electroactivity of the PAASA, cyclic voltammograms and electrochemical impedance spectra of PAASA cathode and Zn anode are measured in aqueous solution containing NH_4Cl and ZnCl_2 . The electrochemical performances show that the specific capacity of the Zn-PAASA aqueous battery is 145 mAh g^{-1} , which is far beyond that conventional Zn-PANI aqueous batteries under the same conditions, and retains 95 mAh g^{-1} of the capacity after 150 cycles. Thus, the Zn-PAASA secondary batteries may become the next generation of high-performance battery by further research.

Keywords: Poly (aniline-co-5-aminosalicylic acid); Zinc; aqueous secondary battery; Graphite paper; Current collector

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