Short communication

A Novel Flexible Aluminum//Polyaniline Air Battery

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The electrochemical behavior of pure aluminum (Al) foil in the NH₄Cl electrolyte was investigated, and it was found that the additives sodium nitrate and triethanolamine (TEA) play a synergistic role in the activation of the Al electrode. Using the Fe(III)-anthraquinone-2,6-disulfonate(AQDS)-doped polyaniline electrode (PANI/Fe) as the air electrode, Al as counter electrode, a gel electrolyte of NH₄Cl, TEA and NaNO₃, a flexible and ultrathin air battery was prepared. The resulting Al//PANI/Fe air battery exhibits excellent electrochemical performance, and it has a thickness of approximately 0.5 mm, a discharge plateau of 1.2 V, and a discharge capacity of 50 mAh·cm⁻². The battery is inexpensive, environmentally friendly, and feasible to use as a disposable battery.

Keywords: Aluminum anode activation; Fe(III)-AQDS-doped Polyaniline air electrode; Flexible battery

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