

Graphene Based Supercapacitor with High Energy Density and Power Density

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Supercapacitors can serve as energy storage devices for automotive, microelectronics and renewable energy applications due to its high power density, long cycle life and high safety performance[1]. However, the energy density of market available supercapacitor is low and hence making the cost higher than that of lithium ion battery. Graphene is a kind of promising electrode material for supercapacitor. The unique 2D structure and excellent electronic conductivity of graphene can build electronic conducting network in the electrode laminate[2]. At the same time, the introduction of graphene can also help ions transport by electrolyte adsorption[3]. Here, a graphene based supercapacitor with higher energy density (>7 Wh/kg) and power density (>14 kW/kg) was achieved on pilot scale by us. The capacity retention is 95% after 30000 cycles at the rate of 40C.

The excellent performances of this supercapacitor is due to the active material and the device assemble process. Graphene/active carbon composite is prepared by in-situ coating. And it is kneaded in adhesives slurry with a high solid content. After coating, calendaring, slitting, winding and injection process, the capacitor is obtained.

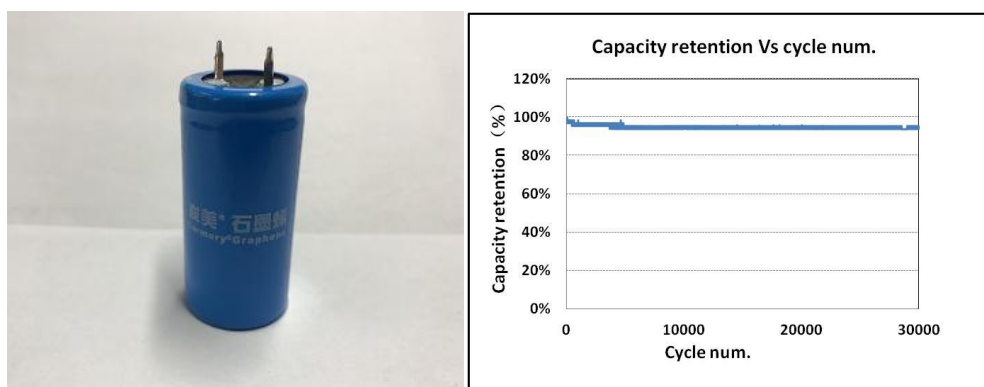


Fig 1 The image (left) and the cycle performance (right) of the supercapacitor(condition:25°C,Rate: 40C)

References:

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