

Preparation of graphene/carbon fiber composites for improving electrochemical properties on VRFBs electrodes

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In recent years vanadium redox flow battery(VRFB) has received great attention as one of important energy storage system. Because VRFB has various advantage, such as long cycle life, high efficiency, flexible design, high reliability, low maintenance costs and environmental friendship. VRFB electrode plays an important role by providing sites for the electrochemical reactions between electrode and electrolyte. VRFB electrode is used carbon felt mostly, because carbon felt has good electro conductivity, high specific surface area and so on, as porous carbon fiber materials. But carbon felt has poor electrochemical property, so it caused low energy density. To improve electrochemical property of electrode, graphene/carbonfiber composite was prepared by electrospinning and heat treatment. At the same time, silane coupling agent grafted with graphene oxide (GO) in order to prevent aggregation of GO. So modified graphene oxide(MGO)/PAN based carbon fiber was prepared. This carbon composites were investigated in physical and electrochemical aspects.