**ABSTRACT**

Attaining high energy density and power density in a single energy storage device is still a major challenge for electrochemical energy storage research community. Sodium-ion hybrid supercapacitor is a sustainable energy storage system which accomplishes the gap between battery and supercapacitor comprises of high energy density-battery type faradaic anode and high power density-supercapacitor type non-faradaic cathode. Here we have reported high surface area (1554 m2 g−1) activated porous carbon obtained from naturally occurring viscous liquid honey as a cathode and sol-gel derived, V2O5 nanorods anchored reduced graphene oxide (rGO) nanocomposite as an anode for non- aqueous sodium-ion capacitor. When explored honey derived carbon as a non-faradaic cathode, it exhibits a higher specific capacitance of 224 F g−1 and V2O5@rGO anode delivers the maximum capacitance of 289 F g−1 at 0.01 A g−1 vs Na/Na+. The prepared V2O5@rGO anode has long stable cycle life (V2O5 nanorods@rGO retains 85% of the initial capacitance (112.2 F g−1) at the current density of 0.06 A g−1 after 1000 cycles). The assembled sodium-ion capacitor (NIC) using honey derived activated carbon (AC) and V2O5@rGO anode delivers the energy density of ≈65 Wh kg−1 and power density of ≈72 W kg−1 at 0.03 A g−1. The capacity retention is 74% after 1000 cycles at the current density of 0.06 Ag−1. The assembled sodium-ion hybrid capacitor delivers maximum energy and power density and exhibits very long stable cycle life.