ABSTRACT:

Energy-saving devices are the ultimate flexible solution to overcome power shortages. Here, we work on the synthesis of nanoflowers MoO_2/PVP in N doped GO substrate as electrode materials for supercapacitors. Pure phase nanosheets with floral molybdenum dioxide (MoO_2) are assembled using an efficient and low-cost hydrothermal method. The morphology of nanocomposites is studied using scanning electron microscope. The structural analysis will be performed using X-ray diffraction (XRD) and RAMAN spectroscopy. Electrochemical properties using cyclic voltammetry and the galvanostatic charge-discharge were carefully analyzed using potentiostat.

The Electrochemical properties of N-Go, MoO_2 and MoO_2/NGO/PVP are compared. The improved electrochemical performance of the MoO_2/NGO/PVP electrode with specific capacitance 980 F/g can be attributed to the high conductivity delivered by N-GO and the improved response of MoO_2 nanosheets due to their higher surface area. The stability of nanohybrid is much higher as compared to pure N-GO and MoO_2 nanoflowers. These nanohybrids are the promising candidate for efficient energy storage devices. Our model indicates that the aliphatic chains of PVP forming a multi-layer shell influence the mass transport of precursor ions to control the growth rate of nanocomposites. Such structures can be designed and implemented in other transition metal dichalcogenide based ternary materials for enhanced photocatalytic and other applications.