**ABSTRACT**

Using sol-gel thermolysis method, potassium manganese phosphate (a mixture of KMnPO4⋅H2O and KMnPO4 phases) was synthesized for supercapacitor applications. XRD analysis revealed phase composition and crystal structure of the prepared material. The dittmarite-type structure of KMnPO4⋅H2O as the primary phase was identified through full profile Rietveld refinement technique. The possible four normal modes of vibrations ν1(A1), ν2(E), ν3(F2), and ν4(F2) were analyzed through FTIR spectrum. Submicron-sized particles are identified using FE-SEM and TEM images. The layered structure of potassium manganese phosphate was corroborated through SAED pattern. Electrochemical performances of the mixed potassium manganese phosphate are investigated using cyclic voltammetry (CV) to identify the suitable aqueous electrolytes (1 M KOH, 1 M LiOH, and 1 M NaOH). It provides the maximum specific capacitance of 516 F g−1 at 2 mV s−1 in 1 M KOH aqueous electrolyte. The Trasatti plot revealed that the observed high specific capacitance mainly arises from the inner surface charge contribution. The electrode shows the better specific capacity of 329 F g−1 at a current density of 0.6 mA cm−2 in galvanostatic charge-discharge measurements. The electrochemical impedance spectral analysis (EIS) further corroborates that the charge-transfer resistance (*R*ct) is low in 1 M KOH (2.25 Ω) electrolyte than in 1 M LiOH (9.2 Ω) and 1 M NaOH (50.7 Ω) electrolytes.