**Abstract**

As a novel approach, LiMnPO4 has tried as a positive electrode material for the super capacitor system because of its large operating voltage, low cost and environmental friendliness. It is a promising cathode material for Li ion batteries

due to its higher redox voltage, 4.1 V vs. Li/Li+, compared to other cathode materials [1-5]. In the present work, LiMnPO4 was synthesized via sol-gel thermolysis using lithium dihydrogen phosphate, manganese acetate were starting materials with citric acid as a fuel. Physical properties, structural and elemental analysis of electrode materials were studied by TEM, X-ray diffraction and EDAX measurements. Surface morphology of the sample shows a thin layer of carbon coating in the as-prepared sample which enhances the electronic conductivity in the charge carrier discharge. The electrochemical performance of the LiMnPO4 electrode materials were studied using cyclic voltammetry, galvanostatic charge-discharge cycling and electrochemical impedance spectroscopy in a three electrode system at a potential range from -0.6 to 0.4 V vs Hg/HgO in 1 M LiOH electrolyte solution. The result exhibits a specific capacitance of 151 F/g at a scan rate of 5 mV s-1. The maximum specific capacitances of 123 F/g for total electrode at 1 A/g were achieved in 1M LiOH solution. These encouraging results promote interest in developing such electrode materials for super capacitor applications, including nontoxic and greener components compared with current organic based devices.