**Abstract**

Demand of low-cost carbonaceous anode materials for lithium-ion batteries has led to the development of anode materials from different bio-sources. In this regard, tamarind seed (skin) was used as a precursor to prepare disordered carbon as an anode material for lithium-ion batteries. The carbon was prepared through simple hydrothermal method and was characterized by X-ray diffraction (XRD), Raman spectroscopy, Brunauer–Emmett–Teller (BET) measurements, field emission scanning electron microscopy (FE-SEM), and transmission electron microscopy (TEM) techniques. It exhibited amorphous carbon particles arranged in a fiber-like morphology with high surface area of 508 m2 g−1. The binder content was optimized for the carbon to achieve high and stable capacity. Electrochemical performance of the as-prepared carbon with optimized binder content showed a stable reversible specific capacity of 224 mAhg−1 after 300 cycles at 1 C-rate. The stable cycling performance of carbon at high current rate is explained by electrochemical impedance spectroscopy (EIS) and FE-SEM data of cycled electrodes. The low cost and stable specific capacity make the carbon as potential anode material for lithium-ion battery.