**Abstract**

In the present work, we report environmental friendly green synthesis of carbonated hydroxyapatite (HAp) sheet like nanoparticles employing waste eggshells of the hen and *zingiberacae* (known as ginger) extract as the starting precursors. The structural and morphological analyses were carried out by using XRD, FTIR, Raman, FESEM and TEM. The characterization studies confirm the phase purity, size, crystalline nature and sheet like morphology of carbonated HAp. The thermal analysis using TG/DTA confirms the thermal stability of carbonated HAp nanosheets. Evaluation of *in-vitro* preosteoblasts cell viability evinces that the carbonated HAp nanosheets are biocompatible. The obtained results confirm that the carbonated hydroxyapatite (HAp) sheet like nanostructures are biocompatible and could be used as biomaterials for orthopedic and other biological applications. Further, the present findings open a new process for waste management (recycling), making green environment and preparing nano structured biomaterials from naturally available resources and medicinal plants for biological applications.