

## The synthesis, characterization and in vivo study of mineral substituted hydroxyapatite for prospective bone tissue rejuvenation applications

### ABSTRACT

Minerals substituted apatite (M-HA) nanoparticles were prepared by the precipitation of minerals and phosphate reactants in choline chloride-Thiourea (ChCl-TU) deep eutectic solvent (DESs) as a facile and green way approach. After preparation of nanoparticles (F-M-HA (F = Fresh solvent)), the DESs was recovered productively and reprocess for the preparation of R-M-HA nanoparticles (R = Recycle solvent). The functional groups, phase, surface texture and the elemental composition of the M-HA nanoparticles were evaluated by advance characterization methods. The physicochemical results of the current work authoritative the successful uses of the novel (ChCl-TU) DESs as eco-friendly recuperate and give the medium for the preparation of M-HA nanoparticles. Moreover, the as-synthesized both M-HA nanoparticles exhibit excellent biocompatibility, consisting of cell co-cultivation and cell adhesion, in vivo according to surgical implantation of Wistar rats.

**Keyword:** Apatite; Bone tissue rejuvenation; Green synthesis; Morphology; In vivo