Abstract

Today, efficient straightforward biocompatible drug carriers have revolted advanced drug delivery systems. The study aims to investigate the modification of halloysite nanotubes by chitosan (CTS) and pectin (PCN) for forming a new pH-sensitive nanocomposites via Layer-by-Layer method. The main objective of this study is to improve loading efficiency and control release of phenytoin sodium (PHT) prepared in various pH. The formation of nanocomposite was confirmed through using FTIR, zetapotential, TG, SEM, XRD, and UV spectroscopy analyses. Based on the obtained results, HNT/CTS/PCN nanocomposite prepared with the molar ratio of 2:1:2 had the best loading capacity (34.6 mg/g) compared with pure HNT (18.3 mg/g). In-vitro studies showed that prepared bionanocomposites had a low release of PHT in the simulated gastric fluid while having a more controlled release in the simulated intestinal fluid. Because of the loading efficiency and controlled release profile, the composites exhibited great potential for the controlled drug delivery of PHT.

Keywords: Halloysite nanotube; Phenytoin Sodium; Controlled Release; Chitosan; Pectin