

Development of antiproliferative nanohybrid compound with controlled release property using ellagic acid as the active agent.

ABSTRACT

An ellagic acid (EA)–zinc layered hydroxide (ZLH) nanohybrid (EAN) was synthesized under a nonaqueous environment using EA and zinc oxide (ZnO) as the precursors. Powder X-ray diffraction showed that the basal spacing of the nanohybrid was 10.4 Å, resulting in the spatial orientation of EA molecules between the interlayers of 22.5° from z-axis with two negative charges at 8,8' position of the molecules pointed toward the ZLH interlayers. FTIR study showed that the intercalated EA spectral feature is generally similar to that of EA, but with bands slightly shifted. This indicates that some chemical bonding of EA presence between the nanohybrid interlayers was slightly changed, due to the formation of host–guest interaction. The nanohybrid is of mesopores type with 58.8% drug loading and enhanced thermal stability. The release of the drug active, EA from the nanohybrid was found to be sustained and therefore has good potential to be used as a drug controlled-release formulation. In vitro bioassay study showed that the EAN has a mild effect on the hepatocytes cells, similar to its counterpart, free EA.

Keyword: Antiproliferative; Nanohybrid; Controlled release property; Ellagic acid.