# PROTOCATECHUIC ACID-ZINC/ALUMINIUM LAYERED DOUBLE HYDROXIDE NANOCOMPOSITE AS AN ANTICANCER NANODELIVERY SYSTEM

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Protocatechuic acid, an anticancer agent has been intercalated into Zn/Al-layered double hydroxide at Zn to Al molar ratio of 2 using two different preparation methods; co-precipitation and ion-exchange and labeled as PZAE and PZAC, respectively. The release of the anion, protocatechuate from both of the nanocomposites occurred in a controlled manner governed by pseudo-second order kinetics. The basal spacing of resulting nanocomposites PZAE and PZAC was 10.2 and 11.0 Å, respectively, indicating successful intercalation of protocatechuate anions into the interlayer galleries of Zn/Al-LDH in monolayer arrangement with an angle of 24 and 33° from z axis for PZAE and PZAC, respectively. The formation of the nanocomposites was confirmed by Fourier transform infrared study and surface area analysis showed that the nanocomposites are of mesoporous-type material. The thermal stability of the intercalated protocatechuic acid significantly enhanced compared to its counterpart, free protocatechuic acid. The drug loading in the nanocomposites was estimated to be about 32.6% in PZAE and 29.2% in PZAC. Both PZAE and PZAC nanocomposites inhibit the growth of human cervical (HeLa), liver (HepG2) and colorectal (HT29) cancer cell lines and show no toxic effect towards normal fibroblast 3T3 cell after 72 hours of treatment.