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## Aspirin drug intercalated into zinc-layered hydroxides as nanolayers: Structure and *in vitro* release

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Zinc-layered hydroxides (ZLHs) can be called host materials for drugs due to the resulting host-guest structures they can form. Aspirin at concentrations of 0.1 and 0.4 M were intercalated into zinc-layered hydroxides to form two aspirin nanocomposites, ASPN1 and ASPN4, respectively. Using X-ray diffraction (XRD) and software programs, the interlayer spacing of ASPN1 and ASPN4 was found to be 15.2 Å. Coupling this result with molecular geometry calculation indicates that the spatial orientation of the drug in the ZLH was in the form of a monolayer for ASPN1 and ASPN4 nanocomposites. The release of the aspirin from the ASPN4 nanocomposite at pH 6.8 was found to be 35%, hence following the Hixson model, compared to 98% at pH 1.2, which followed the Korsmeyer model. This result indicated sustained release of the drug from its respective nanocomposite, and therefore this nanocomposite has good potential to be used as an aspirin delivery system. The ASPN4 nanocomposite was highly effective against *Escherichia coli* resulting in a 1.37 cm inhibition zone compared to free aspirin which only gave a 1.17 cm inhibition zone.

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