

**Inorganic-based phytohormone delivery vector of 2-chloroethylphosphonate nanohybrid, a new stimulating compound with controlled release property to increase latex production.**

ABSTRACT

New inorganic-based phytohormone delivery system, a stimulating compound to increase latex production was developed through hybridisation of 2-chloroethylphosphonic acid (ethephon) into the interlayer of Zn–Al-layered (ZAL) double hydroxide. The hybridisation product, ZADO, was synthesised using co-precipitation technique at pH 7.5, 0.08 M ethephon and initial molar ratio of Zn to Al,  $R = 4$ . The resulting material has a basal spacing of 11.5 Å and Fourier transform infrared spectra further supported the hybridisation episode of ethephon into the ZAL. The release behaviour of the active agent, ethephon from the nanohybrid was found to be of controlled manner, governed by pseudo-second order kinetics. These results indicate that it is possible to design and develop a new delivery system of a phytohormone, [ethephon (2-chloroethylphosphonate)] with controlled release property to increase latex production of rubber tree (*Hevea brasiliensis*).

**Keyword:** Intercalation; Nanohybrid; Self-assembly; Controlled release formulation; Layered double hydroxide.