

## **Synthesis of (cinnamate-zinc layered hydroxide) intercalation compound for sunscreen application**

### **ABSTRACT**

Background Zinc layered hydroxide (ZLH) intercalated with cinnamate, an anionic form of cinnamic acid (CA), an efficient UVA and UVB absorber, have been synthesized by direct method using zinc oxide (ZnO) and cinnamic acid as the precursor. Results The resulting obtained intercalation compound, ZCA, showed a basal spacing of 23.9 Å as a result of cinnamate intercalated in a bilayer arrangement between the interlayer spaces of ZLH with estimated percentage loading of cinnamate of about 40.4 % w/w. The UV-vis absorption spectrum of the intercalation compound showed excellent UVA and UVB absorption ability. Retention of cinnamate in ZLH interlayers was tested against media usually came across with sunscreen usage to show low release over an extended period of time. MTT assay of the intercalation compound on human dermal fibroblast (HDF) cells showed cytotoxicity of ZCA to be concentration dependent and is overall less toxic than its precursor, ZnO. Conclusions (Cinnamate-zinc layered hydroxide) intercalation compound is suitable to be used as a safe and effective sunscreen with long UV protection effect.

**Keyword:** Cytotoxicity; Optical properties; Sunscreen; Zinc layered hydroxide; Zinc oxide.