



Toxicity evaluation of aluminum diethylphosphinate flame retardant

Leoncio, TOL² Fernandes, AS¹; Felzenszwalb, I¹; Oliveira, DP³; Dorta, D.J³; Sampaio, C.F³; Ferraz, ERA²

¹Department of Biophysics and Biometrics, Roberto Alcântara Gomes Biology Institute, Rio de Janeiro State

²University, Rio de Janeiro, Brazil. School of Pharmacy. Fluminense Federal University, Niterói, RJ, Brazil

³University, São Paulo, Brazil. São Paulo University, Ribeirão Preto, SP, Brazil

*thaislucena@id.uff.br;

Aluminum diethyl phosphinate (ALPI) is a halogen-free flame retardant (FR) of industrial interest, since halogenated FRs has demonstrated to be toxic to humans and environmental healths. Although ALPI is being used as a safer alternative, there is a lack of data in the literature attesting its safety. Other compounds in the same class have shown toxicity in *in vitro* experimental or animal models. Considering the use of FR in the most diverse industrial segments, which ends up exposing workers as well as users of the final product and the environment, this work aimed to evaluate the mutagenic, cytotoxic, and genotoxic potential of the flame retardant ALPI. The *Salmonella*/microsome assay with and without metabolic activation was performed using the strains TA97, TA98, TA100, TA102, and TA104 with the compound at concentrations of 0.2; 2; 20; 200 µg/mL. *Water soluble tetrazolium salt -1* (WST-1) and lactic dehydrogenase (LDH) cell viability assays were performed in a HepG2 cell model in ALPI periods of 24, 48 and 72 hours of incubation at concentrations of 0.02; 0.2; 2; 20; 200 µg/mL of ALPI. For the cytokinesis blocking micronucleus assay (CBMN), the same concentrations and cell model of the viability assays were used, with a treatment period of 3 hours. The *Salmonella*/microsome assay in the absence and presence of S9 mix showed that ALPI and its biotransformation products did not induce point mutations at neither of concentrations. WST-1 and LDH assays showed that ALPI did not exhibit cytotoxicity at neither of tested concentration either through interfering with mitochondrial dehydrogenases activity or plasma membrane disruption. The CBMN indicated



genotoxicity of ALPI when at 200 ug/mL and no cytotoxicity. This research provides data on the toxicity profile of ALPI *in vitro*, encouraging implementation of more specific legislation for FR.

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