Substance Information Document

Cinnamaldehyde

1. Substance identity

Name	Cinnamaldehyde
Synonyms	2-Propenal, 3-fenil-; 2-Propenal, 3-phenyl-; 3-Phenyl-2-propen-1-al; 3-Phenyl-2-propenaldehyde; 3-Phenylacrylaldehyde; 3-Phenylpropenal; Cinnamic aldehyde; Cinnamyl aldehyde; Beta-Phenylcrolein. (not exhaustive list)
IUPAC Name	(E)-3-phenylprop-2-enal
CAS	104-55-2

2. Toxicological information

Cinnamaldehyde is easy absorbed within the body rapidly and further distributed in various organs. It is distributed primarily to the gastrointestinal tract, kidneys, and liver, after single- or multiple-dose oral administration. At all tested dose levels, a small amount of the dose was distributed to the fat. Benzoic acid was the major metabolite, suggesting that saturation of the glycine conjugation pathway occurs at repeated high dose levels of cinnamaldehyde. From observation in rats, more than 80% was recovered in the urine and less than 7% in the feces, regardless of dose level.

From different studies conducted on rats, mice and guinea pigs, the oral LD_{50} value was determined to be greater than 2000 mg/kg bw. From available data and a determined dermal LD_{50} value greater than 2000 mg/kg bw, it was concluded that cinnamaldehyde was not toxic when applied dermally to the test animals.

Based on available key data and supporting study, it was concluded that cinnamaldehyde was able to cause skin and eye irritation. Based on available observations and results, it was concluded that cinnamaldehyde gave positive reactions of skin sensitization when applied at higher concentrations in humans as well as in animals.

Ames assay as per OECD TG 471 was performed to investigate the potential of the test chemical to induce gene mutations in comparison to vehicle control using the *Salmonella typhimurium* strains TA 1535, TA 1537, TA 98, TA 100 and TA 102. Cinnamaldehyde was not mutagenic to mammalian cells *in vitro*. In an *in vitro* Mammalian Chromosome Aberration Test performed as per OECD TG 473, cinnamaldehyde was found to be not mutagenic at the highest tested concentration of 0.5 mg/ml both in the presence and in the absence of metabolic activation. Cinnamaldehyde was tested non-mutagenic in an *in vitro* gene mutation study performed according to OECD TG 476, when CHO cells were exposed up to 31.25 µg/ml of test chemical both in the presence and in the absence of S9 metabolic activation.

A mouse micronucleus test was conducted to evaluate the mutagenic nature of cinnamaldehyde *in vivo* in male ddYmice. Based on the results of this study, it was proven that the test chemical did not induce gene mutation.
In a 14-day oral repeated dose toxicity study, B6C3F1 mice were administered cinnamaldehyde in corn oil by gavage. The no observed adverse effect level (NOAEL) of the test chemical was considered to be 656 mg/kg/day. The low observed adverse effect level (LOAEL) of the test chemical was considered to be 1310 mg/kg/day. The LOAEL value for cinnamaldehyde was found to be 750 mg/kg/3D (intermittent) in mouse for 3 days. Based on the data from NTP chronic studies on rat and mice, the overall conservative NOAEL for systemic toxicity was considered to be 100 mg/kg/day. Dietary exposure to trans-cinnamaldehyde was not associated with an increased risk of cancer according to two-year studies involving rats and mice. In shorter studies (90 days) minimal to moderate forestomach epithelial hyperplasia has been observed at high concentrations of trans-cinnamaldehyde. This effect was considered as likely an adaptive response to mucosal irritation caused by the chemical at high concentrations. Based on the presented data, cinnamaldehyde was regarded to be not carcinogenic.
Cinnamaldehyde was given by oral gavage to 25 pregnant Wistar rats in a study performed according to OECD TG 414 and GLP. NOAEL for maternal systemic toxicity was considered to be 250 mg/kg bw/day and NOAEL for developmental toxicity was considered to be 250 mg/kg bw/day.

JECFA	JECFA. (2000). Evaluation of certain food additives and contaminants: fifty-fifth report of the Joint FAO/WHO Expert Committee on Food Additives
FEMA	CINNAMALDEHYDE | FEMA (femaflavor.org)
EFSA	EFSA; Scientific Opinion on Flavouring Group Evaluation 68 (FGE.68) EFSA Journal 2009; 7(11):2009. [51 pp.]. doi:10.2903/j.efsa.2009.1032.
ECHA – REACH dossier	ECHA. (2022, 01 18). ECHA Dossier: Cinnamaldehyde
PUBCHEM	Cinnamaldehyde | C9H8O - PubChem (nih.gov)
CIR	-
OSHA	-

3. Addictiveness and attractiveness

No ingredient-specific data are available.

SCENIHR	-
EMA	-
PUBMED	-