Substance Information Document

trans-hex-2-enal

1. Substance identity

Name	trans-hex-2-enal
Synonyms	(2E)-2-Hexenal; 2-Hexenal; 2-Hexenal, (2E)-; 2-Hexenal, (E)-; 2-trans-Hexenal; Hexen-2-al *(not exhaustive list)*
IUPAC Name	(E)-hex-2-enal
CAS	6728-26-3

2. Toxicological information

Linear a,β-unsaturated aldehydes, including trans-2-hexenal, are rapidly absorbed, distributed, metabolized and excreted, predominantly in urine, with a small amount in faces. No substance-specific data regarding respiratory tract irritation were identified.

No reliable skin irritation studies were conducted with trans-2-hexenal; however, *in silico* data predicted the test substance to be irritant. Therefore, trans-2-hexenal can be considered as having skin irritating potential. However, from available data from human studies, concentrations below 4 % are not expected to be irritating to human skin. No substance-specific data regarding eye irritation were identified. Trans-2-hexenal does not present a concern for phototoxicity or photoallergenicity.

The chemical structure of trans-2-hexenal indicates that it could initiate and activate key events 1, 2, and 3 of the skin sensitization Adverse Outcome Pathway (AOP). In two local lymph node assays, the EC3 value of trans-2-hexenal was 1012 µg/cm^2. In a human maximization test conducted on 25 subjects, no reactions indicative of sensitization were observed with 4% (2760 µg/cm^2) trans-2-hexenal, whereas in another test with 236 µg/cm^2 trans-2-hexenal, sensitization effects were observed in 6/25 subjects. In other tests with 38, 37, 106 and 109 subjects, 18 - 23 µg/cm^2 trans-2-hexenal did not induce sensitization. Based on the weight of evidence from structural analysis and from animal and human studies, trans-2-hexenal is considered as skin sensitizer with a Weight of Evidence No Expected Sensitization Induction Level (WoE NESIL) of 18 µg/cm^2.

Oral median lethal dose (LD_{50}) values of 780 - 1130 mg/kg bw were reported for trans-2-hexenal in rats. From a subchronic toxicity study performed on rats fed diets containing trans-2-hexenal for 13-weeks, a no-observed-effect level (NOEL) of approximately 80 mg/kg bw/day was determined.

From the available genotoxicity studies, trans-2-hexenal has been demonstrated to have a genotoxic potential but *in vitro* particularly, without metabolic activation, in sensitive bacterial strains (TA100/104) and mammalian cell lines with low detoxification capability. *In vivo* mutagenicity and clastogenicity studies were mainly negative. This suggests that although the chemicals in α,β-unsaturated aliphatic aldehydes group are highly reactive and bind to DNA, effects may be limited to the point of contact with the body. The ESFA Panel concluded that the concern for genotoxicity [for trans-2-hexenal] could be ruled out.

Based on the limited data that are available, there is insufficient evidence of carcinogenicity.

Both EFSA and JECFA concluded that there was no safety concern at current levels of intake when trans-2-hexenal is used as a flavoring agent (MSDI - EU: 2761 µg/capita/day and MSDI – USA: 409µg/capita/day).

JECFA	JECFA. (2004). Evaluation of certain food additives: sixty-third report of the Joint FAO/WHO Expert Committee on Food Additives
FEMA	Adams, et al. (2008). Food and Chemical Toxicology 46 (2008) 2935–2967. The FEMA GRAS assessment of α,β-unsaturated aldehydes and related substances used as flavor ingredients
EFSA	EFSA. (2018). Scientific Opinion on Flavouring Group Evaluation 200, Revision 1 (FGE.200 Rev.1): 74 α,β-unsaturated aliphatic aldehydes and precursors from chemical subgroup 1.1.1 of FGE.19
ECHA – REACH dossier	ECHA. (2022, 05 11). ECHA Dossier: trans-hex-2-enal
PUBCHEM	2-Hexenal | C6H10O - PubChem (nih.gov)
CIR	-
OSHA	-

3. Addictiveness and attractiveness

No specific-ingredient data were identified.

SCENIHR	-
EMA	-
PUBMED	-