Substance Information Document

Nonanal

1. Substance identity

Name	Nonanal
Synonyms	Nonylaldehyde; 1-Nonanal; Aldehyde C-9; Pelargonaldehyde; Pelargonic aldehyde
IUPAC Name	nonanal
CAS	124-19-6

2. Toxicological information

The toxicity of nonanal has been widely studied and the substance has been evaluated by several expert groups.

No substance-specific respiratory tract irritation or sensitization data were identified. Nonanal was not irritating to human skin at 1%, however a single dermal exposure of rabbits to the neat material across three studies demonstrated persistent erythema, severe oedema and burns, which suggest that nonanal is severely irritating/corrosive to the skin. Reversible irritation (involving necrosis, hyperkeratosis, and exfoliation) was seen in a 2-week study involving the application of a 25% concentration to the intact and abraded skin of rabbits. Moderate transient irritation was reported when the neat material was instilled into the eyes of rabbits. Nonanal was not sensitizing in a human maximization test or a guinea pig open epicutaneous test, both involving skin applications of up to 2%. However, a review and a case study identified it as a contact allergen, and it was predicted to be positive for skin sensitization in a direct peptide reactivity assay.

No acute or repeated-exposure systemic inhalation data were identified. The oral and 24-hour dermal LD50 values were reported as ≥5000 mg/kg bw, indicating a very low order of acute toxicity by these routes. A NOAEL of 29 mg/kg bw/day was determined in a limited 12-week rat dietary study and was used as the point of departure for JECFA's group ADI. No adverse systemic effects were reported in a limited 2-week dermal study in rabbits, with a systemic NOAEL established as 500 mg/kg bw/day. In each study, only a single dose-level was tested.

No concerns for genotoxicity were raised by the EC JRC, JECFA or the US EPA in their evaluations of nonanal. No mutagenic effects were observed across five bacterial reverse mutation (Ames) tests, and no genotoxicity was seen in the majority of in vitro studies with mammalian cells (including human and rat liver cells). No in vivo genotoxicity, carcinogenicity or reproductive/developmental toxicity data were identified.

JECFA	906. Saturated aliphatic acyclic linear primary alcohols, aldehydes and acids (WHO Food Additives Series 40) (inchem.org)
FEMA	3. GRAS Substances(2001-3124)_0.pdf (femaflavor.org)
EFSA	-

ECHA – REACH dossier	Registration Dossier - ECHA (europa.eu)
PUBCHEM	Nonanal | C9H18O - PubChem (nih.gov)
CIR	-
OSHA	-

3. Addictiveness and attractiveness

No substance-specific data were identified.

SCENIHR	-
EMA	-
PUBMED	RIFM fragrance ingredient safety assessment, nonanal, 5-ethyl-2-methyl-, CAS Registry Number 68141-14-0 - PubMed (nih.gov)