Substance Information Document

Acetic acid

1. Substance identity

Name	Acetic acid
Synonyms	Ethanoic acid Ethylic acid
IUPAC Name	acetic acid
CAS	64-19-7

2. Toxicological information

Acetic acid is locally toxic (potentially corrosive, depending on concentration) to the skin, eye and respiratory tract. However, in two human studies, only minor signs of eye irritation were detected after 2 and 4 hours of exposure to 25 mg/m^3. When inhaled or ingested, acetic acid gave asthma-like symptoms in few individuals. Concentrations of 125 mg/m^3 are intolerable to most persons due to irritation of the nose and throat.

Inhaled acetic acid is of low acute systemic toxicity in rats and in mice. Acetic acid is also of low acute oral toxicity in rodents (LD_{50} >3000 mg/kg bw), but of moderate acute oral (LD_{50} 1200 mg/kg bw) and dermal (LD_{50} 1060 mg/kg bw exposed for an unspecified duration) toxicity in rabbits.

A small number of repeated-dose studies have been performed with acetic acid, showing neurobehavioural effects and changes to red blood cells (probably due to irritative effects), in volunteers exposed at ≥15 mg/m^3. Microscopic kidney lesions were observed in rats who had inhaled acetic acid at 75 mg/m^3 for 35 days.

Expert panels from the EFSA concluded that acetic acid does not present a concern for genotoxicity. European experts consider unlikely to present carcinogenicity and reproductive or developmental toxicity. No multi-generation, postnatal or developmental toxicity studies are required, given the human exposure in diet. In mice and rabbit receiving up to 1600 and 345 mg/kg bw/day acetic acid by gavage, respectively, foetal toxicity and maternal toxicity were observed, but the findings may not be relevant to human. No fertility studies were identified.

An inhalation DNEL of 25 mg/m^3 for the general population has been calculated by the industry REACH registrants for acetic acid, based on respiratory tract irritation. ICH has derived a PDE of 3200 mg/day for acetic acid specifically, which is applicable to all exposure routes [equivalent to about 111 mg/m^3].

JECFA	906. Saturated aliphatic acyclic linear primary alcohols, aldehydes and acids (WHO Food Additives Series 40) (inchem.org)
FEMA	0320 FEMA GRAS 29 (femaflavor.org)
EFSA	Scientific Opinion on the evaluation of the substances currently on the list in the annex to Commission Directive 96/3/EC as acceptable

	previous cargoes for edible fats and oils – Part II of III - - 2012 - EFSA Journal - Wiley Online Library Conclusion on the peer review of the pesticide risk assessment of the active substance acetic acid (wiley.com)
ECHA – REACH dossier	Registration Dossier - ECHA (europa.eu)
PUBCHEM	Acetic acid | CH3COOH - PubChem (nih.gov)
CIR	-
OSHA	-

3. Addictiveness and attractiveness

SCENIHR included a listing for acetic acid, but provides no summaries of studies investigating the addictiveness of this flavouring ingredient, nor do they provide an opinion or highlight a concern for such an effect. An in vitro study investigated physiologically-relevant concentrations of acetic acid in the nucleus accumbens shell of mice, showing increased excitability of the medium spiny neurons and enhanced the glutamatergic synaptic activity, which the investigators suggested may mediate effects on mood and motivation. Acetic acid was identified in 16% of the e-liquid samples tested and indicated to increase attractiveness.

SCENIHR	Final Opinion on Additives used in tobacco products (Opinion 1) (europa.eu)
EMA	-
PUBMED	Comprehensive overview of common e-liquid ingredients and how they can be used to predict an e-liquid's flavour category - PubMed (nih.gov)