

Substance Information Document

lemon oil

1. Substance identity

Name	Lemon oil
Synonyms	N/A
IUPAC Name	N/A*
CAS	8008-56-8

*Non answered, IUPAC Name was not found.

2. Toxicological information

Limonene is the major constituent of lemon oil. It is expected to be readily absorbed by oral and inhalation route. Dermal absorption has no information but is assumed to be lower.

Acute toxicity testing indicated an oral LD50 (similar to OECD TG 401 in rats) > 5000 mg/kg bw and a dermal LD50 (similar to OECD TG 402 in rabbits) > 10000 mg/kg bw. There is no data on acute inhalation toxicity.

In the same acute dermal toxicity study, skin irritating potential of lemon oil was evaluated as well. Study did not follow any skin irritation testing guideline but the results at 24 hours indicated that lemon oil should be considered as irritating to skin. In a separate study following FDA guideline, the eye irritation potential of 5% lemon oil was evaluated in rabbits. Results indicated that lemon oil at 5% is not irritating to eyes. In a LLNA study following OECD TG 429, the skin sensitization potential of d-limonene was evaluated. The results indicated that d-limonene is a skin sensitizer.

For genotoxicity endpoint, three in vitro tests (OECD TG 471, TG 473, and TG 476) were done with lemon oil. Results indicated that lemon oil is not mutagenic or clastogenic.

For repeated toxicity endpoint, the major constituent d-limonene has been tested in various studies with either dogs or rats. Some of the studies are similar to OECD TG 408. Clear effects of d-limonene on kidneys of male rats and dogs were identified, but it has been demonstrated as not relevant for humans. Therefore, the NOEL identified in those studies might not be a good DoP to calculate reference dose for humans. Another 90-day repeated dose toxicity has been proposed by the REACH registrant in order to address all the major constituents in lemon oil for this endpoint.

Developmental toxicity of d-limonene was evaluated in several studies with either rabbits or rodents. No guidelines were followed in any of the studies. Based on the results, d-limonene was not considered as a developmental toxicant. REACH registrant has proposed to conduct a two-generation reproduction toxicity and a developmental toxicity study in order to address all the major constituents in lemon oil.

No carcinogenicity study was identified for lemon oil.

JECFA	-
FEMA	LEMON OIL (CITRUS LIMON (L.) BURM. F.) FEMA (femaflavor.org)

	LEMON ESSENCE OIL (CITRUS LIMON (L.) BURM. F.) FEMA (femaflavor.org)
EFSA	-
ECHA – REACH dossier	Registration Dossier - ECHA (europa.eu) on Lemon ext. with CAS 84929-31-7, same GHS classifications on human toxicity endpoints between the 2 CAS.
PUBCHEM	SID 176259070 - PubChem (nih.gov)
CIR	Safety Assessment of Citrus-Derived Peel Oils as Used in Cosmetics (personalcarecouncil.org)
OSHA	-

3. Addictiveness and attractiveness

No substance specific data were identified.

SCENIHR	-
EMA	Assessment report on Citrus bergamia Risso et Poiteau, aetheroleum (europa.eu) No CAS number is given in this report, but the major constituent is also limonene.
PUBMED	