Eucalyptol

Botanical Source

Synonyms CINEOLE (1,8-)
CINEOL (1,8-)
EPOXY-P-MENTHANE (1,8-)

IUPAC Name

CAS Reference 470-82-6

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
182	Listed by the Council of Europe as acceptable for use in food at up to 5 ppm.

US Food and Drug Administration	
Number	Comment
172.515	Approved by the US FDA. FDA 21 CFR 172.515

Joint FAO/WHO Expert Committee on Food Additives (JECFA)		
Number	ADI	Comment
1234	1439	No safety concern at current levels of intake when used as a flavouring agent

FEMA	
FEMA No.	Comment
2465	Generally recognised as safe as a flavour ingredient:GRAS List Number 3

Natural Occurrence and Use in Food
Found in black currants, blueberries, brandy, cantaloupe, cheese, cocoa, grapes, thyme, babaco fruit, bilberry, corn; used in chewing gum, ice cream, baked goods.

Estimated Intake from Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily Intake mg
0.01057	1.316

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Tobacco Product Related Chemical and Biological Studies for Ingredients Added in a Mixture

Smoke Chemistry		
Published Source	Level Tested %	Comment
BAT	0.00300	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.
Philip Morris	0.00010	An overall assessment of the data suggests that this ingredient did not add to the toxicity of smoke.

Ames Activity		
Published Source	Level Tested %	Comment
BAT	0.00300	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00010	Within the sensitivity and specificity of the system the Ames activity of the cigarette smoke was not increased by the addition of the ingredient.

Micronucleus		
Published Source	Level Tested %	Comment
BAT	0.00300	Within the sensitivity of the in vitro micronucleus assay the activity of the cigarette smoke condensate was not increased by the addition of the ingredient.

Neutral Red		
Published Source	Level Tested %	Comment
BAT	0.00300	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke condensate was not increased by the addition of the ingredient.
Philip Morris	0.00010	Within the sensitivity of the test system the in vitro cytotoxicity of the cigarette smoke was not increased by the addition of the ingredient.

Inhalation		
Published Source	Level Tested %	Comment
BAT	0.00300	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Philip Morris	0.00010	The data indicate that the addition of the ingredient, when added with one of three groups, did not increase the inhalation toxicity of the smoke.

References

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Rustemeier K, Stabbert R, Haussmann HJ, Roemer E, Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 2: chemical composition of mainstream smoke. Food Chem Toxicol. 2002; 40(1): 93-104.

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

References
Baker RR, Bishop LJ. The pyrolysis of tobacco ingredients. J. Anal. Appl. Pyrolysis 2004, 71, 223-311.

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Toxicological Data on the Unburnt Ingredient

GENOTOXICITY
[+ve, positive; -ve, negative; ?, equivocal; with, with metabolic activation; without, without metabolic activation]

In vivo
No relevant data identified.

In vitro

Test system	Test conditions	Endpoint	Activation status	Results	Reference
Chinese hamster ovary (CHO) cells	Chromosome aberration test with cineole [eucalyptol]. [No further details in expert review.]	Chromosome damage	With and without S9	-ve	Galloway et al. 1987
Chinese hamster ovary (CHO) cells	Chromosome aberration test with 1,8-cineol [eucalyptol]. Without S9: up to 0.78 mg/ml (toxic above 0.66 mg/ml); With S9: up to 0.81 mg/ml.	Chromosome damage	With and without rat liver S9	-ve [This may be the same study as Galloway et al. (1987) described above.]	NTPa, undated
Chinese hamster ovary (CHO) cells	Tested for ability to effect the induction of sister chromatid exchanges (SCE) by a known mutagen. [No further details in expert review.]	Chromosome effects	[Not stated in expert review]	No increase in SCE	Sasaki et al. 1989

Chinese hamster ovary (CHO) cells	Sister chromatid exchange test with cineole [eucalyptol]. [No further details in expert review.]	Chromosome effects	With and without S9	+ve [at concentrations that caused cell cycle delay and therefore possibly a secondary effect of general toxicity]	Galloway et al. 1987
Chinese hamster ovary (CHO) cells	Sister chromatid exchange test with 1,8-cineol [eucalyptol]. Experiment 1 (without S9): up to 0.5 mg/ml; Experiment 2 (without S9): up to 0.6 mg/ml (toxic above 0.4 mg/ml); with S9: up to 0.9 mg/ml (toxic above 0.8 mg/ml).	Chromosome effects	With and without rat liver S9	Experiment 1: weak +ve Experiment 2: +ve [This may be the same study as Galloway et al. (1987) described above.]	NTPa, undated
Salmonella typhimurium strains TA97a, TA98, TA100, TA102	Ames test with 1,8-cineole [eucalyptol] at 250 to 2500 ug/plate.	Mutation	With and without S9	-ve	Gomes-Carneiro et al. 1998; Gomes-Carneiro et al. 1997
Salmonella typhimurium strains TA98, TA100, TA1537, TA1538	Ames test with 1,8-cineol [eucalyptol] at up to 3.3 mg/plate.	Mutation	With and without rat and hamster liver S9	-ve	NTPb, undated

Salmonella typhimurium	Ames test with eucalyptol. [No further details in expert review.]	Mutation	With and without S9	-ve	Haworth et al. 1983
Salmonella typhimurium	Ames test with eucalyptol. [No further details in expert review.]	Mutation	With and without S9	-ve	Oda et al. 1978
Bacillus subtilis	Rec assay with eucalyptol. [No further details in expert review.]	DNA damage [indirect test]	N/A	-ve	Yoo, 1986
Bacillus subtilis	Rec assay with eucalyptol. [No further details in expert review.]	DNA damage [indirect test]	N/A	-ve	Oda et al. 1978

References

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Galloway S M et al. (1987). Chromosome aberrations and sister chromatid exchanges in chinese hamster ovary cells: evaluation of 108 chemicals. Envir. molec. Mutagen. 10(S10), 1 (cited in BIBRA, 1991).

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