

Guaiacol

Botanical Source

Synonyms HYDROXY ANISOLE (ortho-)
METHYL CATECHOL
METHOXY PHENOL (ortho-)
PYROGUAIAIC ACID
PYROCATECHOL MONOMETHYL ETHER
METHYL CATECHOL (ortho-)
HYDROXY-2-METHOXY BENZENE (1-)
METHOXY PHENOL (2-)

IUPAC Name

CAS Reference 90-05-1

E Number

Food Legislation

Council of Europe (CoE)	
Number	Comment
173	Listed by the Council of Europe as acceptable for use in food at up to 1 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
713	-	No safety concern at current levels of intake when used as a flavouring agent.

FEMA	
FEMA No.	Comment
2532	-

Natural Occurrence and Use in Food
Found in celery, cocoa, coffee, rum, soybean, tea, tomato, whiskey, wine; used in ice cream, ices, baked goods, meat, chewing gum, dairy products.

Estimated Intake from Food and Drink	
Daily Intake mg/kg/day	FEMA Possible Average Daily Intake mg
0.0003107	0.643

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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	0.00100	At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke.

Ames Activity		
Published Source	Level Tested %	Comment
BAT	0.00100	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.

Micronucleus		
Published Source	Level Tested %	Comment
BAT	0.00100	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	0.00100	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.

Inhalation		
Published Source	Level Tested %	Comment
BAT	0.00100	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.
Lorillard	0.00001	The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke.

Mouse Skin Painting		
Published Source	Level Tested %	Comment
Lorillard	0.00001	None of the changes appeared to be substantial enough to conclude that the tumour promotion capacity of the condensate was discernibly different between condensate produced from cigarettes with the ingredient in comparison with condensate from cigarettes without the ingredient.

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

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Toxicological Data on the Unburnt Ingredient

[+ve, positive; -ve, negative; ?, equivocal

with, with metabolic activation; without, without metabolic activation]

In vitro

Test system	Test conditions	Endpoint	Activation status	Results	Reference
Human dental pulp (D824) cells	Chromosome aberration test after exposure to guaiacol at up to 3 mM [0.37 mg/ml] for 3 or 30 hours.	Chromosome damage	Without	+ve (30-hour treatment)	Someya et al. 2008
Syrian hamster embryo cells	Chromosome aberration test after exposure to guaiacol at 1 mM [0.12 mg/ml] for 24 hours.	Chromosome damage	Without	+ve	Hikiba et al. 2005
Human lymphocytes	Tested at up to 31 µg/ml, cells examined for sister chromatid exchanges.	Chromosome effects	Without	Weak +ve	Jansson et al. 1986
Syrian hamster embryo cells	Sister chromatid exchange test after exposure to guaiacol at 0.3 mM [0.037 mg/ml] for 24 hours.	Chromosome effects	Without	+ve	Miyachi & Tsutsui, 2005
Syrian hamster	Unscheduled	DNA damage	With and	+ve in the	Hamaguchi

embryo cells	DNA synthesis (UDS) assay after exposure to guaiacol at 3 μ M [0.37 μ g/ml].	(indicative test)	without [presumably S9]	presence of metabolic activation	& Tsutsui, 2000
Syrian hamster embryo cells	Cell transformation assay after exposure to guaiacol at 0.1 mM [0.012 mg/ml] for 48 hours.	Transformation	Without	+ve	Yamaguchi & Tsutsui, 2003
Human dental pulp fibroblasts	Assessment for DNA single-strand breaks.	DNA damage	Not known	-ve	Chang et al. 2000
<i>Salmonella typhimurium</i> strains TA98, TA100, TA102	Ames test with concentrations 0.001-112 mg/plate.	Mutation	With and without S9	-ve	Aeshbacher et al. 1989
<i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537, TA1538	Ames test with concentrations up to 16 mg/plate according to expert review.	Mutation	With and without S9	-ve	Douglas et al. 1980
<i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537	Ames tests with concentrations up to 3 or 10-12 mg/plate.	Mutation	With and without rat and hamster liver S9	-ve (Good quality studies)	Haworth et al. 1983; NTP, 1980
<i>Salmonella typhimurium</i> strains TA98,	Ames test (spot test) with	Mutation	With and without S9	-ve (Limited	Florin et al. 1980

TA100, TA1535, TA1537	concentration of 3 μ mol [372 μ g]/plate.			assay with no assessment of dose- response)	
<i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537, TA1538	Ames test with concentrations up to 16 mg/plate according to expert review.	Mutation	With and without S9	-ve	Nestmann et al. 1980
<i>Salmonella typhimurium</i> strains TA98, TA100, TA1535, TA1537, TA1538	Ames test with concentrations up to 5 mg/plate according to expert review.	Mutation	With and without S9	-ve	Pool & Lin, 1982
<i>Salmonella typhimurium</i> strain TA1538	No data given in expert review.	Mutation	With and without S9	-ve (Very limited study)	Ferretti et al. 1977
<i>Escherichia coli</i> PQ37	Tested at 5 mM [0.62 mg/ml] in water or 20% aqueous ethanol, SOS chromotest.	DNA damage	Without	-ve	Ohshima et al. 1989
<i>Saccharomyces cerevisiae</i> D7	Gene mutation assay in yeast, tested at up to 2 mg/ml.	Mutation	Without	-ve	Nestmann et al. 1983

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