ALPHA-PINENE

MODULE 1

SUBSTANCE INFORMATION SHEET

ALPHA-PINENE

CAS number	80-56-8 7785-26-4
Natural Origin	Alpha-Pinene is a natural ingredient found in a wide variety of fruits, vegetables, nuts, spices, grains, cheeses, heated meat products, and essential fragrance oils.
Chemical Formula	C_{10}-H_{16}
Synonymes	2,6,6-Trimethylbicyclo(3.1.1)hept-2-ene; 2,6,6-Trimethylbicyclo(3.1.1)-2-hept-2-ene; 4,6,6-Trimethylbicyklo(3,1,1)hept-3-en [Czech]; Monoterpenes; 4,6,6-Trimethylbicyklo(3,1,1)hept-3-en
E number	N/A
FEMA GRAS number	2902

General Information

Council of Europe (CoE)

Number	Comment
2113	N/A

US Food & Drug Administration (FDA)

Number	Comment
21 CFR 172.515	Approved by U.S. FDA as Food Additives.

Joint FAO/WHO Expert Committee on Food Additives (JECFA)

Number	ADI	Comment
1329	ACCEPTABLE	No safety concern at current levels of intake when used as a flavouring agent.

European Food Safety Authority (EFSA)

Number	Comment
01.004	Aliphatic and aromatic hydrocarbons.

Flavors & Extracts Manufacturers Association (FEMA)

Number	Comment
2902	Generally Recognized as Safe as a flavor ingredient - GRAS 3

Uses and Exposure

α-Pinene is used as a diluent in color additive mixtures for food, and has direct food additive uses as a synthetic flavoring substance or adjuvant, and as a chewing gum base. As a fragrance ingredient in personal care and home care consumer formulations, α-pinene has reported uses in soaps, detergents, cream/lotions and perfumes.

Estimated Intake from Food and Drink

Daily Intake
The total higher-intake consumption value for α-pinene was estimated by summing the FEMA disappearance per capita consumption with the eaters-only DINFO consumption, and is equal to 3.84 mg/kg/day.

Summary of the Toxicological Investigations on the Use of the Substance in Tobacco Products

Smoke Chemistry

Internal Studies	Level Tested ppm	Comment
Carmines for Philip Morris	1	The effect of the addition of alpha-pinene as part of a mixture at concentrations up to 1 ppm on the composition of the cigarette smoke was investigated.

Neutral Red Uptake Assay (NRU)

Internal Studies	Level Tested ppm	Comment
Carmines for Philip Morris	1	The effect of the addition of alpha-pinene as part of a mixture at concentrations up to 1 ppm on the cytotoxicity, as measured by the Neutral Red Uptake assay, was investigated.

AMES Assay

Internal Studies	Level Tested ppm	Comment
Carmines for Philip Morris	1	The effect of the addition of alpha-pinene as part of a mixture at concentrations up to 1 ppm on the mutagenic response, as measured by the Salmonella reverse mutation assay, was investigated.

Mouse Lymphoma Assay (MLA)

Internal Studies	Level Tested ppm	Comment
N/A	N/A	N/A

In vivo Micronucleus

Internal Studies	Level Tested ppm	Comment
N/A	N/A	N/A

Inhalation studies

Internal Studies	Level Tested ppm	Comment
Carmines for Philip Morris	1	The effect of the addition of alpha-pinene as part of a mixture at concentrations up to 1 ppm on the toxicity of cigarette smoke, as suggested in a 90-day inhalation study, was investigated.

References

1. Clydesdale, F. M. (1997) alpha-Pinene. Food Additives: Toxicology, Regulation and Properties. CRC Press, Boca Raton, FL. CD-ROM.

2. CSFII 1994-96 (2000) Continuing Survey of Food Intakes by Individuals (CSFII) 1994-96, 98. Agricultural Research Service, US Department of Agriculture, Washington, DC. CD-ROM.

3. Lucas, C. D.; Putnam, J. M. and Hallagan, J. B. (1999) alpha-Pinene. In 1995 Poundage and Technical Effects Update Survey. Flavor and Extract Manufacturers' Association of the United States, Washington, DC. p. 249.

4. NAS (1989) alpha-Pinene. In 1987 Poundage and Technical Effects Update of Substances Added to Food . National Research Council, National Academy of Sciences, Washington, DC. p. 476.

5. Stofberg, J. and Grundschober, F. (1987) Consumption ratio and food predominance of flavoring materials. alpha-Pinene. Perfumer and Flavorist 12: