

Decalactone (gamma-)

Botanical Source

Synonyms

DECAN-4-OLIDE
HYDROXY DECANOIC ACID, gamma-LACTONE (4-)
DECANOLIDE-1,4
DECANOLIDE (4-)
DECANOLIDE (1,4-)
DECANOLACTONE (1,4-)
HEXYL-gamma-BUTYROLACTONE (gamma-n-)

IUPAC Name

CAS Reference 706-14-9

E Number

Food Legislation

Council of Europe (CoE)

| Number | Comment |
|--------|---|
| 2230 | Listed by the Council of Europe as acceptable for use in food up to 20 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 |
|--------|-----|--|
| 231 | - | No safety concern at current levels of intake when used as a flavouring agent. |

FEMA

| FEMA No. | Comment |
|----------|---------|
| 2360 | - |

Natural Occurrence and Use in Food

Found in apricot, beer, blue cheese, grape brandy, plum brandy, wheat bread, cantaloupe, cheese; used in baked goods, frozen dairy products.

Estimated Intake from Food and Drink

| Daily Intake mg/kg/day | FEMA Possible Average Daily Intake mg |
|------------------------|---------------------------------------|
| 0.006 | 4.58 |

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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 | 0.00150 | At maximum application level this ingredient is not associated with significant increases in levels of Hoffmann analytes in smoke. |
| Philip Morris | 0.00020 | 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 | 0.00150 | 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 | 0.00020 | 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 | 0.00150 | 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 | 0.00150 | 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 | 0.00020 | 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 | 0.00150 | The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke. |
| Lorillard | 0.00020 | The results indicate that the addition of the ingredient had no discernible effect on the inhalation toxicity of mainstream smoke. |
| Philip Morris | 0.00020 | 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. |

| Mouse Skin Painting | | |
|----------------------------|----------------|--|
| Published Source | Level Tested % | Comment |
| Lorillard | 0.00020 | 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. |

| References |
|--|
| Baker RR, Pereira da Silva JR, Smith G. The effect of tobacco ingredients on smoke chemistry. Part I: Flavourings and additives. Food Chem Toxicol. 2004; 42 Suppl:S3-37. |
| Baker RR, Pereira da Silva JR, Smith G. The effect of tobacco ingredients on smoke chemistry. Part II: casing ingredients. Food Chem Toxicol. 2004; 42 Suppl:S39-52. |
| Baker RR, Massey ED, Smith G. An overview of the effects of tobacco ingredients on smoke chemistry and toxicity. Food Chem Toxicol. 2004; 42 Suppl:S53-83. |
| Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 1: cigarette design, testing approach, and review of results. Food Chem Toxicol. 2002; 40(1): 77-91. |
| 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. |
| Roemer E, Tewes FJ, Meisgen TJ, Veltel DJ, Carmines EL. Evaluation of the potential effects of ingredients added to cigarettes. Part 3: in vitro genotoxicity and cytotoxicity. Food Chem Toxicol. 2002; 40(1): 105-111. |
| Vanscheeuwijck PM, Teredesai A, Terpstra PM, Verbeeck J, Kuhl P, Gerstenberg B, Gebel S, Carmines EL. Evaluation of the potential effects of ingredients added to |

cigarettes. Part 4: subchronic inhalation toxicity. Food Chem Toxicol. 2002; 40(1): 113-131.

Gaworski CL, Dozier MM, Heck JD, Gerhart JM, Rajendran N, David RM, Brennecke LH, Morrissey R. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: 13 week inhalation exposures in rats. Inhal. Toxicol. 1998; 10:357-381

Gaworski CL, Heck JD, Bennett MB, Wenk ML. Toxicologic evaluation of flavor ingredients added to cigarette tobacco: skin painting bioassay of cigarette smoke condensate in SENCAR mice. Toxicology. 1999; 139(1-2):1-17.

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Tobacco Product Related Chemical and Biological Studies for Ingredients Tested Singly

| References |
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| 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

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

In vitro

| Test system | Test conditions | Endpoint | Activation | Result | References |
|--|--|-------------------------------|------------|--|---------------------------|
| <i>Escherichia coli</i> B/r WP2 and WP2s | Tested up to 2 mg/plate Also tested for its ability to modify activity of known mutagens. | Mutation and antimutagenicity | without | -ve No significant effect on the activity of known mutagens | Kuroda <i>et al.</i> 1986 |

References

Kuroda M *et al* (1986). Bio-antimutagenic effect of lactones on chemical mutagenesis in *Escherichia coli*. *Agricultural and Biological Chemistry* 50, 243-245.