

5.3 Sensitization

Type: no data
 Species: human
 Number of Animals:
 Vehicle:
 Result:
 Classification:
 Method:
 Year: GLP:
 Test substance:
 Remark: no evidences available
 Source: LIQUIGAS S.p.A. MILANO

5.4 Repeated Dose Toxicity

Species: rat Sex: male/female
 Strain: Fischer 344
 Route of admin.: inhalation
 Exposure period: 90 days
 Frequency of treatment: 6 hours per day, 5 days per week
 Post. obs. period:
 Doses: 2 Test groups: 1017 ppm and 4489 ppm (20 male/10 female per group). Negative control group: no treatment (40 male/20 female animals).
 Control Group: yes, concurrent no treatment
 NOAEL: 4489 ppm
 Method: other: procedure as detailed in paper by Aranyi (see Reference).
 Year: 1986 GLP: no data
 Test substance: other TS
 Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish the renal effects of gaseous hydrocarbons.
 Result: There were NO DEATHS, and NO OTHER SIGNIFICANT TOXICOLOGICALEFFECTS were found.
 Serial sacrifices of 10 male and 5 female animals were made after 28 days. The male animals in these groups showed mildbut significant effects characteristic of light hydrocarbon nephropathy. However, at 90 days the animals showed no evidence of kidney effects.
 Clinical signs included HUNCHED POSTURE, LETHARGY and INTERMITTENT TREMOR. No effects were evident from bodyweights, haematological and biochemical parameters, or from histopathology.
 Source: Compañia Española de Petroleos CEPSA Madrid
 Test substance: Tests were carried out on two gas mixtures comprising:
 50% n-butane and 50% n-pentane, and
 50% iso-butane and 50% iso-pentane.

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5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: rat **Sex:** male/female
Strain: Sprague-Dawley
Route of admin.: inhalation
Exposure period: 21 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 3 Test groups: 0.12 mg/l, 1.15 mg/l and 11.80 mg/l (10 male/10 female per group). Negative control group: no treatment (10 male/10 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 11.8 mg/l
Method: other: procedure as detailed in paper by Halder et al. (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish if typical C4 and C5 hydrocarbons could cause kidney damage in male rats.
Result: NO SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Animals showed no clinical signs of distress.

Haematological and biochemical parameters were not significantly different from the negative control group. Bodyweight gains were not abnormal. In particular, there was no evidence of treatment-related pathological lesions, especially the kidney lesions found in male rats exposed to unleaded gasoline vapour.

Source: Compañia Española de Petroleos CEPSA Madrid
Test substance: Tests were carried out on a gas mixture containing 25% by weight of each of the hydrocarbon constituents n-butane, isobutane, n-pentane and isopentane.

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Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 2 Test groups: 1017 ppm and 4489 ppm (20 male/10 female per group). Negative control group: no treatment (40 male/20 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 4489 ppm
Method: other: procedure as detailed in paper by Aranyi (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish the renal effects of gaseous hydrocarbons.

Result: There were NO DEATHS, and NO OTHER SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Serial sacrifices of 10 male and 5 female animals were made after 28 days. The male animals in these groups showed mild but significant effects characteristic of light hydrocarbon nephropathy. However, at 90 days the animals showed no evidence of kidney effects.

Clinical signs included HUNCHED POSTURE, LETHARGY and INTERMITTENT TREMOR. No effects were evident from bodyweights, haematological and biochemical parameters, or from histopathology.

Source: Texaco Ltd Pembroke-Dyfed
Test substance: Tests were carried out on two gas mixtures comprising:
50% n-butane and 50% n-pentane, and
50% iso-butane and 50% iso-pentane.

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Species: rat **Sex:** male/female
Strain: Sprague-Dawley
Route of admin.: inhalation
Exposure period: 21 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 3 Test groups: 0.12 mg/l, 1.15 mg/l and 11.80 mg/l (10 male/10 female per group). Negative control group: no treatment (10 male/10 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 11.8 mg/l
Method: other: procedure as detailed in paper by Halder et al. (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish if typical C4 and C5 hydrocarbons could cause kidney damage in male rats.
Result: NO SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Animals showed no clinical signs of distress.

Haematological and biochemical parameters were not significantly different from the negative control group. Bodyweight gains were not abnormal. In particular, there was no evidence of treatment-related pathological lesions, especially the kidney lesions found in male rats exposed to unleaded gasoline vapour.

Source: Texaco Ltd Pembroke-Dyfed
Test substance: Tests were carried out on a gas mixture containing 25% by weight of each of the hydrocarbon constituents n-butane, isobutane, n-pentane and isopentane.

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5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 2 Test groups: 1017 ppm and 4489 ppm (20 male/10 female per group). Negative control group: no treatment (40 male/20 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 4489 ppm
Method: other: procedure as detailed in paper by Aranyi (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish the renal effects of gaseous hydrocarbons.
Result: There were NO DEATHS, and NO OTHER SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Serial sacrifices of 10 male and 5 female animals were made after 28 days. The male animals in these groups showed mild but significant effects characteristic of light hydrocarbon nephropathy. However, at 90 days the animals showed no evidence of kidney effects.

Clinical signs included HUNCHED POSTURE, LETHARGY and INTERMITTENT TREMOR. No effects were evident from bodyweights, haematological and biochemical parameters, or from histopathology.
Source: OK Raffinaderi AB Göteborg
Test substance: Tests were carried out on two gas mixtures comprising:
50% n-butane and 50% n-pentane, and
50% iso-butane and 50% iso-pentane.

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5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: rat **Sex:** male/female
Strain: Sprague-Dawley
Route of admin.: inhalation
Exposure period: 21 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 3 Test groups: 0.12 mg/l, 1.15 mg/l and 11.80 mg/l (10 male/10 female per group). Negative control group: no treatment (10 male/10 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 11.8 mg/l
Method: other: procedure as detailed in paper by Halder et al. (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish if typical C4 and C5 hydrocarbons could cause kidney damage in male rats.
Result: NO SIGNIFICANT TOXICOLOGICAL EFFECTS were found.
Animals showed no clinical signs of distress.
Haematological and biochemical parameters were not significantly different from the negative control group. Bodyweight gains were not abnormal. In particular, there was no evidence of treatment-related pathological lesions, especially the kidney lesions found in male rats exposed to unleaded gasoline vapour.
Source: OK Raffinaderi AB Göteborg
Test substance: Tests were carried out on a gas mixture containing 25% by weight of each of the hydrocarbon constituents n-butane, isobutane, n-pentane and isopentane.

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Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 2 Test groups: 1017 ppm and 4489 ppm (20 male/10 female per group). Negative control group: no treatment (40 male/20 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 4489 ppm
Method: other: procedure as detailed in paper by Aranyi (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish the renal effects of gaseous hydrocarbons.

Result: There were NO DEATHS, and NO OTHER SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Serial sacrifices of 10 male and 5 female animals were made after 28 days. The male animals in these groups showed mild but significant effects characteristic of light hydrocarbon nephropathy. However, at 90 days the animals showed no evidence of kidney effects.

Clinical signs included HUNCHED POSTURE, LETHARGY and INTERMITTENT TREMOR. No effects were evident from bodyweights, haematological and biochemical parameters, or from histopathology.

Source: Skandinaviska Raffinaderi AB Lysekil
Test substance: Tests were carried out on two gas mixtures comprising:
50% n-butane and 50% n-pentane, and
50% iso-butane and 50% iso-pentane.

(168)

Species: rat **Sex:** male/female
Strain: Sprague-Dawley
Route of admin.: inhalation
Exposure period: 21 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 3 Test groups: 0.12 mg/l, 1.15 mg/l and 11.80 mg/l (10 male/10 female per group). Negative control group: no treatment (10 male/10 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 11.8 mg/l
Method: other: procedure as detailed in paper by Halder et al. (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish if typical C4 and C5 hydrocarbons could cause kidney damage in male rats.
Result: NO SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Animals showed no clinical signs of distress.

Haematological and biochemical parameters were not significantly different from the negative control group. Bodyweight gains were not abnormal. In particular, there was no evidence of treatment-related pathological lesions, especially the kidney lesions found in male rats exposed to unleaded gasoline vapour.

Source: Skandinaviska Raffinaderi AB Lysekil
Test substance: Tests were carried out on a gas mixture containing 25% by weight of each of the hydrocarbon constituents n-butane, isobutane, n-pentane and isopentane.

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5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: rat **Sex:** male/female
Strain: Fischer 344
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 2 Test groups: 1017 ppm and 4489 ppm (20 male/10 female per group). Negative control group: no treatment (40 male/20 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 4489 ppm
Method: other: procedure as detailed in paper by Aranyi (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish the renal effects of gaseous hydrocarbons.
Result: There were NO DEATHS, and NO OTHER SIGNIFICANT TOXICOLOGICAL EFFECTS were found.

Serial sacrifices of 10 male and 5 female animals were made after 28 days. The male animals in these groups showed mild but significant effects characteristic of light hydrocarbon nephropathy. However, at 90 days the animals showed no evidence of kidney effects.

Clinical signs included HUNCHED POSTURE, LETHARGY and INTERMITTENT TREMOR. No effects were evident from bodyweights, haematological and biochemical parameters, or from histopathology.

Source: Phillips Petroleum Company Norway Tananger
Test substance: Tests were carried out on two gas mixtures comprising:
50% n-butane and 50% n-pentane, and
50% iso-butane and 50% iso-pentane.

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5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: rat **Sex:** male/female
Strain: Sprague-Dawley
Route of admin.: inhalation
Exposure period: 21 days
Frequency of treatment: 6 hours per day, 5 days per week
Post. obs. period:
Doses: 3 Test groups: 0.12 mg/l, 1.15 mg/l and 11.80 mg/l (10 male/10 female per group). Negative control group: no treatment (10 male/10 female animals).
Control Group: yes, concurrent no treatment
NOAEL: 11.8 mg/l
Method: other: procedure as detailed in paper by Halder et al. (see Reference).
Year: 1986 **GLP:** no data
Test substance: other TS
Remark: Atmospheric concentrations were monitored during the study. The main objective of the study was to establish if typical C4 and C5 hydrocarbons could cause kidney damage in male rats.
Result: NO SIGNIFICANT TOXICOLOGICAL EFFECTS were found.
 Animals showed no clinical signs of distress.
 Haematological and biochemical parameters were not significantly different from the negative control group. Bodyweight gains were not abnormal. In particular, there was no evidence of treatment-related pathological lesions, especially the kidney lesions found in male rats exposed to unleaded gasoline vapour.
Source: Phillips Petroleum Company Norway Tananger
Test substance: Tests were carried out on a gas mixture containing 25% by weight of each of the hydrocarbon constituents n-butane, isobutane, n-pentane and isopentane.

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Species: monkey **Sex:** male/female
Strain: other: Macaca arctoides
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: no data
Post. obs. period: no data
Doses: no data specified
Control Group: no data specified
Method: other: no data
Year: **GLP:** no data
Test substance: other TS
Result: The effects of an aerosol spray deodorant containing 64.5% (w/w) mixture of isobutane and n-propane were studied in 9 male and 9 female stump-tail monkeys (Macaca arctoides). No deaths occurred. No changes in behaviour, body weight, biochemistry, hematology or urinalysis were observed. Gross and microscopic examination revealed no evidence of organ toxicity.

Only secondary literature; no further data.

Source: BASF AG Ludwigshafen
Test substance: aerosol spray containing n-propane and isobutane (140)

Species: monkey Sex: no data
Strain: other: cynomolgus
Route of admin.: inhalation
Exposure period: 90 days
Frequency of treatment: daily
Post. obs. period: no data
Doses: ca. 1.35 mg/l (750 ppm)
Control Group: no data specified
Method: other: no data
Year: GLP: no data

Test substance: other TS
Result: An antiperspirant containing more than 50% n-propane as propellant was tested in 21 cynomolgus monkeys. Following exposure to the gas, no formulation-induced toxicity was observed.
Only secondary literature; no further data.

Source: BASF AG Ludwigshafen
Test substance: aerosol spray containing >50% n-propane (140)

5.5 Genetic Toxicity 'in Vitro'

Type: Ames test
System of testing: Salmonella typhimurium TA1535; TA1537; TA1538; TA98; TA100
Concentration: Exsikkator test, Gaskonzentration 50 % (v/v)
Metabolic activation: with and without
Result: negative
Method: other: Kirwin et al.: J. Soc. Cosmet. Chem., 31, 367-370, (1980)
Year: GLP: no data

Test substance: as prescribed by 1.1 - 1.4
Source: BASF AG Ludwigshafen (172)

Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: GLP: no data

Test substance: other TS

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of propane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Compañía Española de Petroleos CEPSA Madrid

Test substance: Propane, CAS No. 74-98-6 (173)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of butane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Compañía Española de Petroleos CEPSA Madrid

Test substance: n-Butane, CAS No. 106-97-8 (173)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of isobutane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Compañía Española de Petroleos CEPSA Madrid

Test substance: Isobutane, CAS No. 75-28-5 (173)

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: **GLP:** no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of propane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: Texaco Ltd Pembroke-Dyfed
Test substance: Propane, CAS No. 74-98-6

(174)

Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: **GLP:** no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of butane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: Texaco Ltd Pembroke-Dyfed
Test substance: n-Butane, CAS No. 106-97-8

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Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: **GLP:** no data
Test substance: other TS

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of isobutane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Texaco Ltd Pembroke-Dyfed

Test substance: Isobutane, CAS No. 75-28-5 (174)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of propane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: OK Raffinaderi AB Göteborg

Test substance: Propane, CAS No. 74-98-6 (174)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of butane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: OK Raffinaderi AB Göteborg

Test substance: n-Butane, CAS No. 106-97-8 (174)

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: GLP: no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of isobutane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: OK Raffinaderi AB Göteborg
Test substance: Isobutane, CAS No. 75-28-5

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Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: GLP: no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of propane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: Skandinaviska Raffinaderi AB Lysekil
Test substance: Propane, CAS No. 74-98-6

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Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: GLP: no data
Test substance: other TS

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of butane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Skandinaviska Raffinaderi AB Lysekil

Test substance: n-Butane, CAS No. 106-97-8 (174)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of isobutane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Skandinaviska Raffinaderi AB Lysekil

Test substance: Isobutane, CAS No. 75-28-5 (174)

Type: Ames test

System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.

Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air

Metabolic activation: with and without

Result: negative

Method: other: OECD guideline 479 method adapted to test gaseous substances

Year: GLP: no data

Test substance: other TS

Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of propane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.

Source: Phillips Petroleum Company Norway Tananger

Test substance: Propane, CAS No. 74-98-6 (175)

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: **GLP:** no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of butane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: Phillips Petroleum Company Norway Tananger
Test substance: n-Butane, CAS No. 106-97-8

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Type: Ames test
System of testing: Salmonella typhimurium, reverse mutation assay using strains TA98, TA100, TA1535, TA1537 and TA1538.
Concentration: atmospheric concentrations of 5, 10, 20, 30, 40, and 50% (vol/vol) in air
Metabolic activation: with and without
Result: negative
Method: other: OECD guideline 479 method adapted to test gaseous substances
Year: **GLP:** no data
Test substance: other TS
Remark: Five strains of Salmonella typhimurium were exposed for six hours to concentrations of up to 50% (vol/vol) of isobutane in air. 50% was the highest non-toxic dose. There was no evidence of a significant increase in mutation frequency either in the presence or absence of metabolic activation.
Source: Phillips Petroleum Company Norway Tananger
Test substance: Isobutane, CAS No. 75-28-5

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Type: Ames test
System of testing: Salmonella typhimurium TA98, TA100, TA1535, TA1537, TA1538
Concentration: ca. 91.5 - 915 mg/l (5 - 50 % (v/v))
Metabolic activation: with and without
Result: negative
Method: other: no data
Year: **GLP:** no data
Test substance: as prescribed by 1.1 - 1.4
Remark: Dissicator test (Ames test modified for examination of gases) with and without metabolic activation with S-9-mix prepared from liver homogenate of Aroclor-pretreated rats.

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

The concentration of 50% was the highest non-toxic dose.

Source: BASF AG Ludwigshafen
Test substance: propane; purity 99.9 % by volume (134) (154) (136) (176)

Type: Ames test
System of testing: Salmonella typhimurium TA98, TA100, TA1535, TA1537, TA1538
Concentration: 10, 50, 100, 500, 1000, 5000 ug/plate
Metabolic activation: with and without
Result: negative
Method: other: no data
Year: GLP: no data
Test substance: other TS
Remark: Ames test with and without metabolic activation with S-9 mix prepared from liver homogenate of Aroclor pretreated male rats; no cytotoxicity was observed.

Source: BASF AG Ludwigshafen
Test substance: "compound T-2591Ac"; a mixture containing ca. 25% propane/isobutane (177)

Type: Ames test
System of testing: Salmonella typhimurium TA98, TA100, TA1535, TA1537, TA1538
Concentration: 10, 50, 100, 500, 1000, 5000 ug/plate
Metabolic activation: with and without
Result: negative
Method: other: no data
Year: GLP: no data
Test substance: other TS
Remark: Ames test with and without metabolic activation with S-9 mix prepared from liver homogenate of Aroclor pretreated male rats; no cytotoxicity was observed.

Source: BASF AG Ludwigshafen
Test substance: "compound T-2592Ac"; a mixture containing ca. 25% propane/isobutane (177)

Type: Yeast gene mutation assay
System of testing: Saccharomyces cerevisiae D3
Concentration: 0.005, 0.01, 0.05, 0.1, 0.25, 0.5, 1.0% (no data specified whether w/v or v/v)
Metabolic activation: with and without
Result: negative
Method: other: no data
Year: GLP: no data
Test substance: other TS
Remark: Mutation assay with and without metabolic activation with S-9 mix prepared from liver homogenate of Aroclor pretreated male rats; concentrations of 0.5 and 1.0% were toxic to the cells.
Source: BASF AG Ludwigshafen

Test substance: "compound T-2591Ac"; a mixture containing ca. 25% propane/isobutane (177)

Type: Yeast gene mutation assay
System of testing: Saccharomyces cerevisiae D3
Concentration: 0.005, 0.01, 0.05, 0.1, 0.25, 0.5, 1.0% (no data specified whether w/v or v/v)
Metabolic activation: with and without
Result: negative
Method: other: no data
Year: GLP: no data
Test substance: other TS
Remark: Mutation assay with and without metabolic activation with S-9 mix prepared from liver homogenate of Aroclor pretreated male rats; concentrations of 0.5 and 1.0% were toxic to the cells.
Source: BASF AG Ludwigshafen
Test substance: "compound T-2592Ac"; a mixture containing ca. 25% propane/isobutane (177)

5.6 Genetic Toxicity 'in Vivo'

-

5.7 Carcinogenicity

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of treatment:
Post. obs. period:
Doses:
Result:
Control Group:
Method:
Year: GLP:
Test substance: other TS
Remark: 1,3-butadiene, a possible constituent of petroleum gases, has been shown to be carcinogenic in rodents in inhalation studies, but there is no direct evidence for its carcinogenicity in man.
Source: Compañía Española de Petroleos CEPSA Madrid
Test substance: 1,3-butadiene (178)

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of
treatment:
Post. obs.
period:
Doses:
Result:
Control Group:
Method:
Year: GLP:
Test substance:
Remark: no evidences
Source: LIQUIGAS S.p.A. MILANO

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of
treatment:
Post. obs.
period:
Doses:
Result:
Control Group:
Method:
Year: GLP:
Test substance: other TS
Remark: 1,3-butadiene, a possible constituent of petroleum gases,
has been shown to be carcinogenic in rodents in inhalation
studies, but there is no direct evidence for its
carcinogenicity in man.
Source: Texaco Ltd Pembroke-Dyfed
Test substance: 1,3-butadiene

(179)

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of
treatment:
Post. obs.
period:
Doses:
Result:
Control Group:
Method:
Year: GLP:
Test substance: other TS
Remark: 1,3-butadiene, a possible constituent of petroleum gases,
has been shown to be carcinogenic in rodents in inhalation
studies, but there is no direct evidence for its
carcinogenicity in man.

5. Toxicity

date: 19-FEB-2000
Substance ID: 74-98-6

Source: OK Raffinaderi AB Göteborg
Test substance: 1,3-butadiene

(179)

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of treatment:
Post. obs. period:
Doses:
Result:
Control Group:
Method:
Year: GLP:

Test substance: other TS
Remark: 1,3-butadiene, a possible constituent of petroleum gases, has been shown to be carcinogenic in rodents in inhalation studies, but there is no direct evidence for its carcinogenicity in man.

Source: Skandinaviska Raffinaderi AB Lysekil
Test substance: 1,3-butadiene

(179)

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of treatment:
Post. obs. period:
Doses:
Result:
Control Group:
Method:
Year: GLP:

Test substance: other TS
Remark: 1,3-butadiene, a possible constituent of petroleum gases, has been shown to be carcinogenic in rodents in inhalation studies, but there is no direct evidence for its carcinogenicity in man.

Source: Phillips Petroleum Company Norway Tananger
Test substance: 1,3-butadiene

(180)

5.8 Toxicity to Reproduction

Type:
Species: Sex:
Strain:
Route of admin.:
Exposure Period:
Frequency of
treatment:
Duration of test:
Doses:
Control Group:
Method:
Year: GLP:
Test substance:
Remark: no evidences
Source: LIQUIGAS S.p.A. MILANO

5.9 Developmental Toxicity/Teratogenicity

Species: Sex:
Strain:
Route of admin.:
Exposure period:
Frequency of
treatment:
Duration of test:
Doses:
Control Group:
Method:
Year: GLP:
Test substance:
Remark: no evidences
Source: LIQUIGAS S.p.A. MILANO

5.10 Other Relevant Information

Type: adsorption
Result: The test substance is absorbed systemically when inhaled.
Only secondary literature; no further data.
Source: BASF AG Ludwigshafen
Test substance: propane; no further data

(181)

Type: Distribution
Result: The test substance had been detected in blood of human
volunteers after exposure by inhalation to 250-1000 ppm (ca.
0.45-1.8 mg/l) (Low et al., 1987). After exposure, the test
substance was found in brain, liver and lung (Haq and
Hameli, 1980). Only secondary literature; no further data.
Source: BASF AG Ludwigshafen
Test substance: propane; no further data

(182) (181)