

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF PESTICIDE REGULATION
MEDICAL TOXICOLOGY BRANCH

SUMMARY OF TOXICOLOGY DATA
PETROLEUM HYDROCARBONS

Chemical Code # 401, Tolerance #: 149
SB 950 #: 754
Original date: 12/18/01

I. DATA GAP STATUS

Chronic rat, mouse, hamster:	Data gap, inadequate study, no adverse effect indicated
Chronic, monkey:	Data gap, inadequate study, possible adverse effect indicated
Chronic, dog:	Data gap, inadequate study, possible adverse effect indicated
Oncogenicity, rat:	Data gap, no study on file.
Oncogenicity, mouse:	Data gap, inadequate study, possible adverse effect indicated
Reproduction, rat:	Data gap, no study on file
Teratology, rat:	Data gap, no study on file
Teratology, rabbit:	Data gap, no study on file
Gene mutation:	Data gap, no study on file
Chromosomal aberration:	Data gap, no study on file
DNA damage:	Data gap, no study on file
Neurotoxicity:	Not required at this time

Toxicology one-liners are attached.

All record numbers through 117318 were examined.

** indicates an acceptable study.

Bold face indicates a possible adverse effect.

File name: T011218

Original by: M. Silva, 12/18/01

II. TOXICOLOGY ONE-LINERS AND CONCLUSIONS

These pages contain summaries only. Individual worksheets may contain additional effects.

COMBINED, RAT

No study on file.

CHRONIC TOXICITY, RAT, HAMSTER, MOUSE

149 - 017 117308 "Inhalation Toxicology of Oil Mists (I. Chronic Effects of White Mineral Oil)," (Wagner, WM.D., Wright, P.G., Stokinger, H.E.; U.S. Dept. of Health, Education & Welfare, Public Health Service; Industrial Hygiene Journal, March-April, 1964, pages 158-168). Petroleum base "light" mineral-oil aerosol mist (naphthalene-base saturated hydrocarbons; molecular weight = 350-410; 25-30 carbons) at 5 (current TLV) and 100 mg/m³ used to treat mongrel dogs, Dutch rabbits, Holtzman-Sprague-Dawley rats, Golden-Syrian hamsters and CF #1 and CAF₁/Jax mice (6 hours/day, 5 days/week; 12-26 months) in a full-body inhalation study. All animals were males. NOEL = 5 mg/m³ for all species & strains (At 100 mg/m³, an increase in basic and magnesium-activated phosphatase activities in blood serum and lung of dogs and rats occurred. Histopathology showed a significant increase in pulmonary alveolar and hilar lymph node oil deposition and/or lipid granuloma formation after 12 months of exposure in dogs and rats at 100 mg/m³.) No adverse effect indicated. These data are supplemental. (Kishiyama & Silva, 2/6/01).

CHRONIC TOXICITY, MONKEY

149 - 017 117307 "Effects of Prolonged Inhalation of Oil Fogs on Experimental Animals," (Lushbaugh, C.C., Green, J.W., Redemann, C.E.; Published in: Archives of Industrial Hygiene, 1:237-247, 1950). Automobile (Penn Oil 7, SAE #10) and diesel engine (SGF #1 oil) lubricating oils were administered via inhalation as atomized (fog) particles at 132 and 63 µg/l air, respectively. Particle radii averaged 0.58 micron and 0.45 microns for #10 and #1, respectively. Exposure times to induction of lung irritation and/or pulmonary infection (lipid pneumonia) were 100 and 343 days (mice: CF1 & A), 1 year (rat & rabbit) and 100 days (monkey). Mice, rats and rabbits were unaffected and the occurrence of pulmonary tumors in a highly susceptible "A" mouse strain was not increased with treatment. There was little oil accumulation in lungs of the animals. Retained oil quickly transferred to pulmonary connective tissues and lymph nodes. Auto oil was not as toxic as diesel oil and neither caused lipid pneumonia in animals living in atmospheres of 63-132 µg/l air, since the low pulmonary retention enabled phagocytes to effectively engulf and remove it. **Possible adverse effect indicated: Monkeys had greater oil accumulation (lungs) compared to other species tested. Both oils caused fur thinning/baldness over half the body after 100 days. Decreased food consumption, marked wasting and death were attributed to hyperplastic gastritis. Monkeys also had an increase in infectious pneumonia and interstitial inflammation, relative to controls.** These data are supplemental. (Kishiyama & Silva, 2/5/01).

CHRONIC, DOG

149 - 017 117306 “Evaluation of 90-Day Inhalation Toxicity of Petroleum and Oil Shale Diesel Fuel Marine (DFM),” (Gaworski, C.L., MacEwen, J.D., Vernot, E.H., Haun, C.C., Leahy, H.F., Hall, A.; Air Force Aerospace Medical Research Laboratory, AAMRL-TR-85-074, NMRI 85-57; 12/85). Petroleum (P-DFM) and Oil Shale Diesel Fuel Marine (SO-DFM) were administered continuously by inhalation at 50 and 300 mg/m³ to Beagle dogs (whole body, 3/sex/dose), CDF (Fischer 344)/Crl/BR rats (150/sex/dose) and female C57BL/6 mice (150/dose) for 90 days. All dogs were terminated (90 days), while only 1/3 rodents were terminated. A post-dosing observation period was extended to 19 months (interim kill; 1/3 rodents) and 24 months (sacrifice remainder). NOEL Dogs: SO-DFM & P-DFM = 50 mg/m³ (BUN increased with SO-DFM at ≥ 50 mg/m³. Absolute liver weights increased with P-DFM at 300 mg/m³. Hepatocytic vacuolization occurred with P-DFM at 300 mg/m³.) NOEL Mice: SO-DFM < 50 mg/m³ & P-DFM = 50 mg/m³ (Survival reduced at ≥ 50 mg/m³ SO-DFM. Increased pulmonary inflammation with SO-DFM and liver inflammation with P-DFM at 300 mg/m³. Hepatocellular degeneration with SO-DFM at ≥ 50 mg/m³. Post-exposure with SO-DFM, showed increased bone marrow hyperplasia at ≥ 50 mg/m³.) NOEL (Rats) for SO-DFM & P-DFM < 50 mg/m³ (Body weight gain was reduced (both sexes ≥ 50 mg/m³) with P-DFM and with SO-DFM (males: 300 mg/m³). Both sexes sacrificed after 90-days dosing (P-DFM) had increased nasal mucosal inflammation (P-DFM 300 mg/m³). Males sacrificed after 90-days (P- or SO-DFM) had increased kidney hyaline degeneration. Renal tubular epithelial necrosis occurred in males at 300 mg/m³ (P- or SO-DFM). Inflammation of renal cortical interstitium was increased in males (300 mg/m³ SO-DFM). Kidney lesions were increased, post-exposure, in males treated for 90 days (both treatments ≥ 50 mg/m³). Kidney adenomas (male: P-DFM, 50 mg/m³ & SO-DFM 300 mg/m³), mammary gland fibroadenomas (males & females: SO-DFM & female: P-DFM, 300 mg/m³), pituitary carcinomas (male: SO-DFM & female: SO-DFM, ≥ 50 mg/m³ & P-DFM, 300 mg/m³), thyroid follicular cell tumors (female: SO-DMF ≥ 50 mg/m³) and thyroid C-cell tumors (male: P-DFM ≥ 50 mg/m³ & female: 300 mg/m³; female: SO-DFM ≥ 50 mg/m³) were higher than controls). Not acceptable or upgradeable (major deficiencies).. Possible adverse effect indicated. (Kishiyama & Silva, 1/30/01).

ONCOGENICITY, RAT

N study on file.

ONCOGENICITY, MOUSE

149 - 020 117318 “The Dermal Carcinogenic Potential of Unrefined and Hydrotreated Lubricating Oils,” (McKee, R.H., Daughtrey, W.C., Freeman, J.J., Federici, T.M., Phillips, R.D., Plutnick, R.T.; Journal of Applied Toxicology, 9(4):265-270 (1989), Exxon Biomedical Sciences, Inc., East Millstone, NJ). Several samples of naphthenic distillates (unrefined light, 549-810 °F, viscosity at 40°C = 16.3; hydrotreated light, 546-819 °F, viscosity at 40°C = 16; hydrotreated light, 533-830 °F, viscosity at 40°C = 15.7; unrefined heavy, 649-909 °F, viscosity at 40°C = 62.2; hydrotreated heavy, 607-892 °F, viscosity at 40°C = 45.9; hydrotreated heavy 608-905 °F, viscosity at 40°C = 45.4; unrefined heavy 794-1058, viscosity at 40°C = 484.7; hydrotreated heavy, 743-1047 °F, viscosity at 40°C. = 272.1, hydrotreated heavy, 732-1050 °F, viscosity at 40°C. = 255.4) were applied dermally to male C3H mice (40/group) twice weekly at 37.5 μ l aliquots undiluted for up to 24 months to test potential for dermal carcinogenicity. Hydrotreated oils (reduced in polycyclic aromatic hydrocarbons) of all viscosities did not induce tumors or affect survival. Possible adverse effect indicated. **Epidermal tumors were induced with all unrefined distillates (heavy & light) of all specific activities.** These data are supplemental. (Kishiyama & Silva, 12/7/00).

149 - 020 117317 "Evaluation of Dermal Carcinogenic Potential of Tar Sands Bitumen-Derived Liquids," (McKee, R.H., Stubblefield, W.A., Lewis, S.C., Scala, R.A., Simon, G.S., DePass, L.R.; Published in: Fundamental and Applied Toxicology, 7:228-235 (1986), Exxon Corporation, East Millstone, NJ). Tar sands (80% sand, 10% water, 10% hydrocarbons), bitumen (hydrocarbons derived from tar sands), untreated naphtha (boiling range: 50-250 °C), crude gas oil (> 250 °C) and 3 thermally and catalytically cracked liquids derived from crude gas oil (boiling range: light, 149-316°C, heavy > 316 °C, blended 2:1 heavy/light gas oils >316 °C) were applied dermally (shaved backs) to C₃H/HeJ male mice (50/group, 5/cage) 3 times/week in 25 µl aliquots throughout the life-time. Negative control was highly refined white oil. Results showed the tar sands (0 tumors), bitumen (1 malignant & 1 benign tumor) and untreated naphtha (1 malignant tumor) produced few total epidermal tumors. Crude oil (11M, 2B), light (11M, 4B), heavy (46M, 2B) and gas blend (47M) produced numerous tumors. **Reduced survival correlated with rapid development of tumors (squamous cell carcinomas) in mice treated with heavy and blended gas oils. Carcinogenic potential was moderate for light gas and crude oil.** Supplemental study. (Kishiyama & Silva, 12/7/00).

REPRODUCTION, RAT

No study on file.

TERATOLOGY, RAT

No study on file.

TERATOLOGY, RABBIT

No study on file.

GENE MUTATION

No study on file.

CHROMOSOME EFFECTS

No study on file.

DNA DAMAGE