

Table 1. Health Effect Levels of Methoprene in Laboratory Animals

Route	Duration	Species	NOAEL	LOAEL	Organ/Effect	Comments	Reference
ACUTE DURATION TOXICITY							
dermal	once	rabbit		3,000 mg/kg	LD ₅₀		HSDB 2002
oral	once	rat		2,323 to >34,600 mg/kg	LD ₅₀		HSDB 2002
oral	once	mouse		2,285 mg/kg	LD ₅₀		HSDB 2002
oral	once	dog		5,000 mg/kg	LD ₅₀		HSDB 2002
oral (diet)	2 wks	rat	40,000 ppm		No gross abnormalities	Rats were fed technical-grade methoprene (68.9%) for 2 weeks and a control diet for an additional week. Gross pathologic examination in this top dosage group revealed no abnormalities. Some dose-related growth depression was attributed to palatability problems with the test material. Unpublished study	Jorgenson & Sasmore 1972a
inhalation	once	rat		>210 mg/L air	LC ₅₀		HSDB 2002
Intermediate Duration Toxicity							
dermal	30 day	rabbit	100 mg/kg	300 mg/kg	Erythema at application site	At ≥300 mg/kg, an increase occurred in neutrophil counts, weight loss, elevated leukocyte counts. Gross and histopathological examination indicated the only compound-related finding was confined to the treated skin sites. Unpublished study	Nakasawa et al., 1975b
oral (diet)	90 days	rat		1,000 ppm	Renal tubular regeneration; increase in liver and kidney organ/body weight ratio	Renal tubular regeneration in 3 (of 15) males at 1,000 ppm and 7 (of 15) males at 5,000 ppm. Increase in organ/body weight ratio of liver and kidney at 5,000 ppm. Slightly higher incidence in males at 5,000 ppm of a kidney lesion characterized by vacuoles within swollen convoluted tubules. A NOAEL could not be determined because no animals <1,000 ppm were subjected to histologic evaluation of kidney.	Jorgenson & Sasmore 1972b
oral (diet)	90 days	dog	500 ppm	5,000 ppm	Elevated serum alkaline phosphatase; increased organ/body weight ratio of liver	4 male and 4 female beagles were fed diets containing technical-grade methoprene (68.9%). No treatment-related changes seen in gross pathologic examination and microscopic evaluation of liver and other tissues. Unpublished study	Jorgenson & Sasmore 1972b

Table 1. Health Effect Levels of Methoprene in Laboratory Animals (continued)

Route	Duration	Species	NOAEL	LOAEL	Organ/Effect	Comments	Reference
oral (diet)	6 months	rat	400 ppm	2,000 ppm	Hypertrophy of liver parenchymal cells	400 ppm = 20 mg/kg/day	Nagano 1977
inhalation	4 hrs/day, 5 days/ wk, 3 weeks	rat	20 mg/L			Rats exposed by inhalation to an aerosol of technical-grade methoprene (purity 68.9%) at chamber concentrations of 0, 2, or 20 mg/L air. Alkaline phosphatase and bilirubin showed variations from controls at 2 and 20 mg/L but did not indicate a consistent pattern of toxicity. Gross necropsies and histologic evaluation of liver, lung, kidney, and trachea showed no treatment-related changes. Unpublished study	Olson & Willigan 1972
inhalation	6 days/ wk, 4 weeks	dog	0.0625 mg/kg/day			Groups of 3 male and 3 female beagles were exposed to technical-grade methoprene (in 2% ethanol solution) as aerosol at 0.0125, 0.0250, or 0.0625 mg/kg/day. No compound-related effects were found for body weight, food and water consumption, hematology, blood chemistry, urinalysis, or gross histopathologic findings. Unpublished study	Masao & Hiroyuki 1975
Chronic Duration Toxicity							
oral (diet)	2 years	rat	1,000 ppm	5,000 ppm	Increased incidence of hepatic lesions; increased liver weight	Increased hepatic lesions such as bile duct proliferation of portal lymphocyte infiltration in males at 5,000 ppm; elevated liver weight in 5,000 ppm females. No significant difference in incidence of any particular type of tumor. Unpublished study	Wazeter & Goldenthal 1975b
Developmental/Reproductive Toxicity							
oral (diet)	3 generations	rat	500 ppm	2,500 ppm	Reduced mean pup weight in F2 & F3 litters; elevated mean number of pups born dead per litter in F3 litters	Reduced mean pup weight in F2 litters on day 21 and in F3 litters on days 14 & 21. No compound-related effects observed in parental generations. No treatment-related effects on other tested parameters for offspring. Unpublished study	Killeen & Rapp 1974

Table 1. Health Effect Levels of Methoprene in Laboratory Animals (continued)

Route	Duration	Species	NOAEL	LOAEL	Organ/Effect	Comments	Reference
oral (diet)	78 weeks	mouse	250 ppm	1,000 ppm	Liver lesions	Dose-related increase in incidence and severity of liver lesions at $\geq 1,000$ ppm. Elevated frequency of amyloidosis of the small intestine in females at 2,500 ppm. No compound-related increase in incidence of any particular type of tumor; no evidence suggestive of carcinogenic activity. Unpublished study	Wazeter & Goldenthal 1975a
oral (intubated)	gestation days 7–114	mouse	600 mg/kg/d		No teratogenicity observed	No treatment-related effects observed on mean number of dead embryos or in sex ratio of fetuses. No internal or external abnormalities observed in fetuses. Fetuses of all treated groups displayed a statistically significant increase in number of caudal vertebrae. No compound-related effects reported. No evidence of teratogenicity observed under the conditions of the experiment. Unpublished study	Nakasawa et al., 1975a
oral	gestation days 7–18	rabbit	200 mg/kg/day	2,000 mg/kg/day	Fetotoxicity	Increased percentage of fetal deaths and increased proportion of female fetuses observed in high-dose group. No teratogenicity. NOAEL for fetal toxicity was 200 mg/kg/day on basis of increased percentage of fetal deaths. In top dosage group, 2 does aborted, and maternal weight gain was depressed. NOAEL for maternal toxicity was 200 mg/kg/day on basis of reductions in weight gain and abortions. Unpublished study	Nakasawa et al., 1975b