

APPENDIX I. Health Effects Division (HED) Data Tables for Permethrin

Table 4.1.4.1. Acute Toxicity Profile on Permethrin*				
OPPTS Guideline	Study Type	MRID No.	Results	Toxicity Category
870.1100	Acute oral toxicity in Rats	242899	LD ₅₀ = 3580 mg/kg (M) 2280 mg/kg (F)	III
870.1200	Acute dermal toxicity in Rabbits	242899	LD ₅₀ >2000 mg/kg	III
870.1300	Acute inhalation toxicity in Rats	Data Gap		ND*
870.2400	Acute eye irritation in Rabbits	242899	Irritation 24-48 hrs. All cleared by 72 hrs.	III
870.2500	Acute dermal irritation in Rabbits	242899	All irritation cleared by 48 hrs	IV
870.2600	Skin sensitization in Guinea Pigs	EPA Memo **	Non-sensitizer***	Not Applicable

* ND = No Data

** EPA Memorandum (June 13, 1995) "Permethrin: Review of a series 81-6 dermal sensitization study (guinea pig maximization test) and a series 85-2 dermal penetration study."

*** Based on a weight of evidence evaluation of other sensitization study data do not indicate that permethrin should be regulated as a potential sensitizer.

Table 4.1.4.2. Subchronic, Chronic and Other Toxicity Profile on Permethrin		
Guideline No./ StudyType/	MRID Nos. Doses/Classification	Results
870.3200 21-Day dermal toxicity - Rat	41143801, 42653301 Pb III Summ: 92142030 0, 50, 150, 500 mg/kg/day Acceptable/guideline	The systemic NOAEL was 500 mg/kg/day (the highest dose tested), the systemic LOAEL was not established. The dermal LOAEL was 50 mg/kg/day based on skin irritation. A dermal NOAEL was not identified.
870.3465, 82-4 15-Day inhalation toxicity - Rat	00096713 0, 0.0061, 0.042, 0.583 mg/L Acceptable/non-guideline	The LOAEL is 0.583 mg/L in male and female rats based on body tremors and hypersensitivity to noise. The NOAEL is 0.042 mg/L.
870.3700a Prenatal developmental - Rat	40943603 0, 15, 50, 150 mg/kg/day Acceptable/Guideline	The maternal toxicity LOAEL is 150 mg/kg/day based on clinical signs of toxicity and decreased body weight gain and food consumption. The maternal toxicity NOAEL is 50 mg/kg/day; the developmental toxicity LOAEL is 150 mg/kg/day based on decrease in fetal body weights and an increase in the incidence rate of short length extra ribs. The developmental toxicity NOAEL is 50 mg/kg/day.
870.3700b Prenatal developmental - Rabbit	92142091, 40943602, 92142036 0, 600, 1200, 1800 mg/kg/day Acceptable/guideline	The maternal toxicity LOAEL is estimated to be <600 mg/kg/day based on decreased body weight gain. The maternal toxicity NOAEL is not identified. The developmental toxicity LOAEL is 1200 mg/kg/day based on increased post-implantation loss, greater numbers of early and late resorptions and an equivocal decrease in ossification of the fore- and hind-limbs. The developmental toxicity NOAEL is 600 mg/kg/day.
870.3800 Reproduction and fertility effects - Rat	00102108 00120271 92142092 92142037 0, 500, 1000, 2500 ppm (0, 25, 50, 125 mg/kg/day) Acceptable/guideline	The LOAEL for systemic toxicity is 2500 ppm (125 mg/kg/day) based on tremors observed in the F ₀ females, and the F ₁ and F ₂ males and females. The systemic toxicity NOAEL is 1000 ppm (50 mg/kg/day). The reproductive toxicity NOAEL is <2500 ppm (125 mg/kg/day) and the reproductive toxicity LOAEL is not identified. The NOAEL for offspring growth and development is <2500 ppm (125 mg/kg/day) and the offspring LOAEL is not identified.
870.4300 Chronic toxicity - Rat	92142123 0, 500, 1000, or 2500 ppm 0, 19.4, 36.9, 91.5 mg/kg/day (M) 0, 19.1, 40.2, 104 mg/kg/day (F) Acceptable/guideline	The chronic toxicity LOAEL is 2500 ppm (91.5 mg/kg/day for males and 104 mg/kg/day for females), based on tremors and hypersensitivity. The NOAEL is 500 ppm (36.9 mg/kg/day for males and 19.4 mg/kg/day for females). No tumor
870.4100b Chronic toxicity - dog	00129600 0, 5, 100, 1000 mg/kg/day (capsule) Acceptable/Guideline	The systemic toxicity LOAEL is 1000 mg/kg/day based on clinical neurotoxic signs and decreased body weight gain and food consumption. The NOAEL is 100 mg/kg/day.
870.4200b Carcinogenicity - mouse	00062806, 92142033 0, 3, 71, 286 mg/kg/day (M) 0, 3, 357, 714 mg/kg/day (F) Acceptable/guideline	There were statistically significant increases in liver adenomas at all doses for males and at mid- and high-doses for females with a significant dose-related trend in both sexes.

Table 4.1.4.2. Subchronic, Chronic and Other Toxicity Profile on Permethrin		
Guideline No./ StudyType/	MRID No. Doses/Classification	Results
870.4200b Carcinogenicity - mouse	00102110, 92142032 0, 26.9, 110.5, 287.2 mg/kg/day (M). 0, 29.8, 124.2, 316.1 mg/kg/day (F) Acceptable/guideline	There was no evidence of significant increase in unusual tumor types. A non-significant increase in lung adenomas in males and in lung adenomas plus carcinomas in females was seen at the highest dose.
870.4200b Carcinogenicity - mouse	45597105 0, 5000 ppm (Females only) (0, 780-807 mg/kg/day) Acceptable/non-guideline	There were significant increases in the incidences of lung bronchioloalveolar adenomas in mice. The increased incidences of basophilic hepatocellular adenoma did not show a relationship to the treatment duration. No progression to carcinoma was observed in the lung or liver.
870.5100 Gene mutation Salmonella typhimurium	41031107 Acceptable/guideline	There were no evidence of increased revertant colonies above control in 5 Salmonella strains up to 5000 µg/plate (solubility limit).
870.5550 Unscheduled DNA	40943604 Acceptable/guideline	There was no evidence of unscheduled DNA synthesis above control up to 10 ⁻⁴ M and possibly 10 ⁻³ M (Limits of cytotoxicity).
870.5395 Mouse Bone Marrow Micronucleus	42723302 Acceptable/guideline	There was no evidence that permethrin is clastogenic in the bone marrow cells of mice.
870.6200 Acute Neurotoxicity - Rat	43046301 45657401 Acceptable when considered together	NOAEL = 25 mg/kg/day LOAEL = 75 mg/kg/day based on observations of clinical signs (i.e., aggression, abnormal and/or decreased movement) and increased body temperature.
870.6200 Subchronic neurotoxicity - Rat	00071952 2500,3000,3750,4500, 5000, 7500 ppm Acceptable/nonguideline	The systemic and neuro- toxicity LOAEL is 2500 ppm (125 mg/kg) based on clinical signs of toxicity and decreases in body weight gain and food consumption. The systemic and neuro- toxicity NOAEL was not identified for this preliminary study.
870.6200b Subchronic neurotoxicity -Rat	40766807 0, 100, 200, 400 mg/kg/day Acceptable/nonguideline	The systemic LOAEL is 200 mg/kg/day based on tremors and irritability. The systemic NOAEL is 100 mg/kg/day. The NOAEL is > 400 mg/kg/day with respect to morphological and histological changes.
870.6100b Delayed Neurotox - Hen	00112933 approx. 9000 mg/kg (94.9% a.i.) cis:trans 36:58.9 Acceptable/guideline	Oral administration of permethrin does not produce delayed neuropathy in the hen.
870.6100b Delayed Neurotox - Hen	00097426 0, 2000,4000 mg/kg cis:trans 25:75 Acceptable/guideline	Oral administration of permethrin up to 4000 mg/kg does not produce delayed neuropathy in the hen.

Source

USEPA. 2006. Permethrin. Fifth Revision of the HED Chapter of the Reregistration Eligibility Decision Document (RED). PC Code 109701, Case No. 52645-53-1, DP Barcode D324993. Office of Prevention, Pesticides, and Toxic Substances. Health Effects Division of the Office of Pesticide Programs. Washington, D.C. April 4, 2006.