

MAMMALIAN TOXICOLOGY: **Acute oral** (LD_{50} , mg/kg) mice >5000 (tech.) (in corn oil); rats >5000 (tech.) (in corn oil) **Acute dermal** (LD_{50} , mg/kg) rats >2000 **Acute Inhalation** (LD_{50} , mg/l) rats 1.21 (4 h) **Skin irritation** Not an irritant (rabbits) **Skin sensitisation** Not a sensitiser (guinea pigs) **Eye** Not an irritant (rabbits) **NOEL** (90 d) for male rats 2.4 mg/kg b.w. for female rats 3.1 mg/kg b.w.; (1 y) for dogs 3 mg/kg b.w. Non-mutagenic and non-teratogenic in rats (2 mg/kg b.w. daily) and rabbits (15 mg/kg b.w. daily). **ADI/RfD** (BfR) ADI 0.016 mg/kg b.w. [2006]; (EFSA) ADI 0.01, aRfD 0.01, AOEL 0.007 mg/kg b.w. [2010].

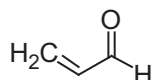
ECOTOXICOLOGY: **Birds** Acute oral LD_{50} for bobwhite quail >2250, mallard ducks >2000 mg/kg. Dietary LC_{50} (8 d) for bobwhite quail 3275, mallard ducks 4175 mg/kg diet. **Fish** LC_{50} for rainbow trout 0.0061, fathead minnows 0.00196, mirror carp 0.12, guppies >0.00492, zebrafish >0.00404 mg/l. **Daphnia** EC_{50} (48 h) 0.000022 mg/l. **Algae** E_bC_{50} and E_rC_{50} (72 h) for *Selenastrum capricornutum* >0.035 mg/l; EC_{50} (96 h) for *Chlorella vulgaris* >0.82 mg/l. **Bees** (LD_{50} , µg/bee) 0.077 (oral); 0.084 (contact) **Worms** LC_{50} (14 d) for earthworms >1000 mg/kg soil. **Other beneficial spp.** LR_{50} (48 h) for *Typhlodromus pyri* 0.006 g/ha.

ENVIRONMENTAL FATE: **Animals** No metabolites found representing >10% of parent compound. **Soil/Environment** Strongly adsorbed onto soil and immobile (irrespective of pH and o.m. content); K_d 2460–2780; K_{oc} 127500–319610. Soil column leaching: <1% of applied acrinathrin found in leachate. DT_{50} 5–100 d (4 soil types). DT_{50} under aerobic conditions (pH 6.2, o.m. 3.1%) 52 d. **Plants** The main residue is the parent compound.

13 acrolein

Herbicide

Target Site Multi-site inhibition



NOMENCLATURE: **Common name** acrolein (BSI, ANSI, WSSA, E-ISO, accepted in lieu of a common name); acroléine ((f) F-ISO)

IUPAC name acrylaldehyde; prop-2-enal

Chemical Abstracts name 2-propenal

CAS RN [107-02-8] **EC no.** 203-453-4 **EPA PC** 000701

PHYSICAL CHEMISTRY: **Composition** Tech. is 92–97%. **M.f.** C_3H_4O **Mol. wt.** 56.1

Physical form Colourless mobile liquid with a pungent odour. **M.p.** ($^{\circ}C$) –87

V.p. (mPa) 2.9×10^7 (20 $^{\circ}C$); 5.9×10^7 (38 $^{\circ}C$) **Henry** ($Pa\ m^3\ mol^{-1}$, calc.) 7.8; 19.5 (meas.)

log K_{ow} 1.08 **Water solubility** (mg/l, 20–25 $^{\circ}C$) 2.08×10^5

Organic solubility (g/l, 20–25 $^{\circ}C$) Soluble in benzene, diethyl ether, ketones, lower alcohols

B.p. 52.5 $^{\circ}C$ /760 mmHg **F.p.** <–17.8 $^{\circ}C$ (closed cup) **S.g./Bulk density** (20–25 $^{\circ}C$) 0.841

Hydrolytic stability (DT_{50}) 3.5 d (pH 5), 1.5 d (pH 7), 4 h (pH 10) **Thermal stability** stable (<80 $^{\circ}C$); reactive chemical; polymerises slowly on storage and violently in presence of concentrated acids, alkalis and amines, may polymerise if exposed to light; must be stored in the dark, under nitrogen.