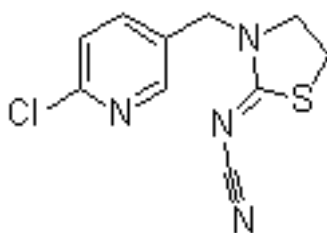


Thiacloprid



Chemical name: Thiacloprid

Other names: (Z)-3-(6-chloro-3-pyridylmethyl)-1,3-thiazolidin-2-ylidenecyanamide CAS: (Z)-[3-[(6-chloro-3-pyridinyl)methyl]-2-thiazolidinylidene]cyanamide

Triaclopride, Tiacloprido, Tiakloprid

Compound: C₁₀H₉ClN₄S

CAS Number: 111988-49-9

Pesticide type: insecticide

Characteristics

A neonicotinoid insecticide (belonging to the chloronicotinoid chemical class,) first registered in 2003. Registered (in 2009) in more than 80 countries worldwide (Germany, France, Poland, Ukraine, Argentina, Australia, Japan, Korea, South Africa, USA). It is closely related to imidacloprid. It works by disrupting the nervous system by acting as an inhibitor at nicotinic acetylcholine receptors mode of action. It is an odorless crystal powder with yellowish color.

Use

Used on broad spectrum of sucking and chewing insects. Used mostly in pome fruit, stone fruit, small berries, cotton, vegetables, sugar beet, potatoes, rice and ornamentals. Pests controlled include aphids, whitefly, beetles.

Possible hazards and regulation

PAN Bad Actor Chemical

WHO II moderately hazardous

Toxicity

Thiacloprid is of moderate acute toxicity via both the oral route and as an aerosol, via the inhalation route. It is not acutely toxic by the dermal route. It is not a skin or eye irritant. Most common signs of toxicity are reductions in body weights in rats, mice and dogs are much less sensitive.

Toxicity to humans

Thiacloprid is rapidly absorbed and is rapidly excreted with little remaining in the tissues. Thus it is not expected to cause poisoning to humans under normal conditions.

ADI 0,01 mg/kg/day

Acute toxicity limits

Oral LD₅₀ in rat is 444 mg/kg suggesting moderate toxicity.

Dermal LD₅₀ in rat is 2000 mg/kg (no deaths occurred).

Inhalation LC₅₀ in rat is greater than 2535 mg/l.

Chronic toxicity:

A long-term NOAEL at 1,2 mg/kg/day based on a 2 year study in rats.

Liver degeneration and necrosis were observed in mice in a 2 year study showing the liver is a target organ for toxicity. Dogs appear less sensitive to the hepatotoxicity. The main concern is the development of thyroid tumours occurring after prolonged exposures.

Reproductive effects:

No evidence of developmental toxicity observed. Absence of effects on fertility demonstrated in a 1 and 2 generation study. It causes reduced body weight, reduced food consumption in maternal rabbits.

Ecological effects

It presents a low risk to wild mammals, birds (one study indicated high toxicity to Japanese quail, but otherwise practically non-toxic to bobwhite quail with an LD50 2716 mg/kg), earthworms, bees, terrestrial plants, fish (moderately toxic to rainbow trout and bluegill sunfish with 96 hour EC50 of 9,25 mg/l), amphibians, algae and aquatic plants. However, it is expected to adversely affect terrestrial insects other than bees as well as insects living in freshwater and marine invertebrates. For example ladybird beetles were highly sensitive in laboratory exposures. Spiders were also adversely affected.

Carcinogenity

US EPA possible carcinogen. The potential has been investigated in both rats and mice in 2 year studies. The result is that thiacloprid causes an increase in malignant uterine adenocarcinomas and thyroid adenomas in rats and ovarian luteomas in mice.

Mutagenity: in vitro and in vivo studies give negative results for mutagenity

Bioaccumulation: limited potential for bioaccumulation or bioconcentration

Mobility: medium to low

Persistence and degradability in environment

In soil, it is thoroughly metabolised and rapidly degraded to CO₂ under aerobic conditions. A total of 2% of the parent compound stays in the extracts after 100 days. The mean DT50 in soil is 4,4 days. It degrades rapidly in the aquatic environment with DT50 values of 31 to 62 days (but very stable in anaerobic aquatic conditions with half life of over 1 year). Therefore, it is not considered to be a persistent compound. It has low to medium potential to leach to ground water. One of its metabolites, sulfonic acid, is expected to be more persistent and mobile than the parent. Also, since thiacloprid has a high water solubility, it results in the potential contamination of surface water following rainfall events.

Limits

Vyhláška 381/2007 Sb.(mg/kg): peaches 0,3, tea 0,05, fresh herbs 3, hops 0,05, strawberries 0,5, rye 1, corn 0,1, wheat 0,1, tomatoes 0,5, plums 0,1, melon 0,2, liver of livestock 0,3, meat 0,01, milk 0,03, eggs 0,01

Codex Alimentarius MRL (mg/kg): cotton 0,02, eggs 0,02, meat 0,1, melon 0,2, milk 0,05, pome fruits 0,7, potato 0,02, rice 0,02, tomatoes 0,5, tree nuts 0,02, wheat 0,1

Hazard Symbol : Xn harmful
N dangerous for the environment

Risk Phrases :

R20 Harmful by inhalation

R22 Harmful if swallowed

R40 Limited evidence of a carcinogenic effect

R50/53 Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment

R63 Possible risk of harm to the unborn child

Safety Phrases :

S36/37 Wear suitable protective clothing and gloves

Links

http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC38856

http://ecb.jrc.ec.europa.eu/documents/Biocides/ANNEX_I/ASSESSMENT_REPORTS/AnnexI_AR_111988-49-9_PT08_en.pdf

<http://www.codexalimentarius.net/pestres/data/pesticides/details.html?id=223>

http://www.apvma.gov.au/registration/assessment/docs/prs_thiacloprid.pdf

<http://sitem.herts.ac.uk/aeru/footprint/en/Reports/630.htm>



This chemical profile is developed with the financial assistance of the European Union . Its contents are sole responsibility of Arnika Association and Armenian Women for Health and Healthy Environment and can under no circumstances be regarded as reflecting the position of the European Union.