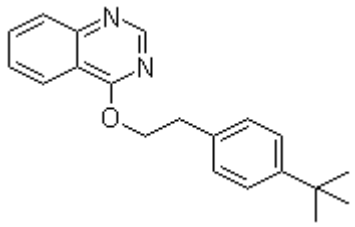
Fenazaquin



Chemical name: 4-tert-butylphenethyl quinazolin-4-yl-ether (IUPAC)
3-[2-[4-(1,1-dimethylethyl) phenyl] ethoxy] quinazoline (CAS)
Other names: fenazakvin, fenazaquina, quinazoline
Compound: $NNOCH_3C\ H_3CH_3$
CAS Number: 120928-09-8
Pesticide type: miticide and insecticide

Characteristics

A pesticide belonging to the quinazoline class of chemicals. It is intended to control insects and mites. There are two possible routes of exposure: ingestion and dermal. It disrupts the biochemistry of insect mitochondria.

Use

This relatively new chemical has been approved for use on citrus fruit and apples and pears. It was approved in 2005 by many countries, 80% of which are in Europe (for example Azerbaijan, Bulgaria, Chile, China, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Korea, Morocco, Peru, Portugal, Russia, Slovakia, South Africa, Spain, Turkey, UK, Uzbekistan and Yugoslavia). In the USA it was approved in 1996 by the Advisory Committee on Pesticides in its annual report. Formulated as Matador, the manufacturers hoped to market this product in integrated pest management (IPM) systems predominantly in apple orchards. However the ACP found Matador extremely dangerous to fish or other aquatic life and there was a high acute risk to fish and free-swimming invertebrates from direct over-spray and spray drift. It can also be used on vegetables, beans, cotton, wine, nuts, olives and flowers.

Possible hazards

Acute exposure: fenazaquin is acutely toxic when administered orally in rats. No data are available on acute toxicity by other routes of exposure.
Repeated exposure: repeated oral administration has been tested in rats, hamsters and dogs and the major findings include significant decrease in body weight, body weight gain, food intake and food efficiency.
WHO II - Moderately Hazardous

Toxicity

A toxic substance, inhalation, ingestion or skin contact may cause severe injury or even death. Effects of inhalation or contact (skin) may be delayed. Contact with molten substance may also cause burns to skin and eyes. Data on the effects of fenazaquin and Matador on non-target arthropods generally suggested high toxicity to predatory mites and ladybirds at lower rates than those that were recommended. It proved not quite relevant for the use in IPM.
In the Czech Republic, although it may be used in apples, it has not been approved for use in apples that are intended to be made into baby food. This was decided by the fruit and vegetable unions in 2006.

Acute toxicity limits

rat (orally) LD50 > 300 mg/kg, rat (inhaled) LC50 1.1 mg/m3, rabbit (dermally) LD50 > 5000 mg/kg, fish LC50, 96 hours 220 µg/l , invertebrates EC50, 48 hours, 2,3 µg/l , algae EC50, 72 hours, 78 µg/l , birds 500 mg/kg <LD50<2000 mg/kg , bees LD50, 48 hours, > 100 µg/l/bee

Ecotoxicity
Very toxic to fish, invertebrates and water plants. Relatively harmless to bees.
According to scientific assessment of chemical toxicity carried out by Antidote Europe (an alternative to standard toxicology methods, looking at how toxic chemicals affect human cells) showed following findings: 22 genes were strongly repressed in liver cells, 11 genes were significantly repressed in neuronal cells, affecting all studied functions in both cell lines.

Carcinogenity: not likely to be carcinogenic to humans

Mutagenity: fenazaquin is not mutagenic

Bioaccumulation: the chemical does not show any potential for bioaccumulation

Mobility: absorbed by soil and low mobility

Persistence and degradability
Long-term negative effect on water environment is expected. The substance is fully soluble in water. Half-life in soil depends on soil type and various conditions and its span is from 18 to 112 days. The substance is extremely bound in soil and highly immune against leaching and elution. While in soil it is subject to microbial degradation, speed-up by light.

Limits
EPA: Apples and pears: 0,2 mg/kg, citrus fruits: 0,5 mg/kg, nuts: 0,01 mg/kg, other fruits and vegetables: 0,01 – 0,1 mg/kg (EC 149/2008)
Vyhláška č. 381/2007 Sb., MRL of pesticides in food: MRL in foods of plant origin- grapes,pears and apples – 0,1 (mg/kg), MRL in foods of animal origin- N/A

ADI - Acceptable daily intake – 0,005 mg/kg/day

Hazard Symbol : Xn – Harmful

Risk Phrases
R22: Harmful if swallowed
R50/53: Very toxic to aquatic organisms/May cause long-term adverse effects in the aquatic environment

Safety Phrases
S2: Keep out of reach of children
S13:Keep away from food, drink and animal feeding stuffs
S20/21:When using do not eat, drink or smoke
S23:Do not breathe spray
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37: Wear suitable gloves
S45: In case of accident or if you feel unwell, seek medical advice immediately (Show the label where possible)
S57: Use appropriate containment to avoid environmental contamination

Links

http://www.epa.gov/opprd001/factsheets/fenazaquin.pdf
http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC36759
http://www.chemicalbook.com/ProductMSDSDetailCB2350051_EN.htm
http://www.pan-uk.org/pestnews/Issue/pn37/pn37p19d.htm
http://www.pronachem.cz/m/Magus%20200%20SC.pdf
http://antidote-europe.org/substances_gb.htm

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