Teflubenzuron -MATERIAL SAFETY DATA SHEET

Manufacturer/information service:
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1. Chemical Product Identification
   Product Name: Teflubenzuron
   Molecular Formula: C_{14}H_{6}Cl_{2}F_{4}N_{2}O_{2}

   ![Chemical Structure]

   Molecular Weight: 381.1
   Chemical Name: N-[(3,5-dichloro-2,4-difluorophenyl)amino]carbonyl]-2,6-difluorobenzamide
   Color: white to yellowish crystals.
  Odor: practically odorless
   CAS No.: 83121-18-0

2. Composition / Information On Ingredients
   Teflubenzuron 94.0%
   Other 6.0%

3. Hazards Identification
   Not applicable

4. First Aid Measures
   Skin: wash with soap and water.
   Eyes: flush with plenty of water for at least 15 minutes. See medical attention if irritation develops or persists.
Inhalation: move to fresh air. Do not breathe spray mist.
Ingestion: if oral contamination, drink 1-2 glasses of water and milk. Call physician/poison control center immediately.
Antidote: antropine and toxogonin

5. Fire-Fighting Measures
Extinguishing media
To be used: dry chemical, foam, carbon dioxide.
Measures of personal protection: safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants.
Environmental cautions
EX: prevent the contamination of the floor and of beds of water.

6. Accidental Release Measures
Personal cautions: safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants.
Cleaning methods
EX: clear the material in time. Transfer to a properly labeled deposit that will be closed and sealed until the recovery of elimination of the product.
Environmental cautions
EX: prevent the contamination of the floor and of beds of water.

7. Handling And Storage
Handling: do not apply to humans, their clothing, or bedding. Do not contaminate food or use on household tanks.
Storage: store in original container only in cool, dry, well-ventilated, secure area out of reach of children and animals.

8. Exposure Controls / Personal Protection
Personal protective equipment
Respiratory protection: approved respirator
Protective gloves: rubber gloves
Eye protection: goggles
Industrial hygiene: use good industrial hygiene. Wear face shield or goggles, elbow length PVC gloves, cotton overalls buttoned to the neck and wrist, washable hat and half face
respirator with dust and vapor cartridge. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

9. Physical And Chemical Properties
Melting Point: 222.5°C
Density: not applicable
Bulk density: not applicable
Water solubility: $2 \times 10^{-5}$ g/l (20°C)
Other solubility: hexane 0.05, methanol 0.13, n-octanol 0.7, 2-propanol 0.8, toluene 0.9, acetonitrile 1.1 (all in g/l, 20°C).

pH: 8.65
Ignition temperature: log POW = 4.56

10. Stability And Reactivity
Conditions to avoid: fire, heat and high temperature
Products to avoid: acid and alkaline pesticides
Thermal decomposition: not applicable
Hazardous decomposition products: oxides of nitrogen, hydrogen, carbon, sulfur, and phosphorous.

11. Toxicological Information
Contact with the skin: no effect on skin.
Contact with the eyes: No signs of irritation
Inhalation: Teflubenzuron has low inhalational toxicity.
Ingestion: salivation, sweating, nausea, vomiting, diarrhea, abdominal cramps, and slurred speech.
Acute Toxicity: After oral treatment, rats and mice showed only slight signs of toxicity, including ruffled fur, dyspnoea, sedation and hunched posture, which had resolved in all cases by 48-72 h. After intraperitoneal administration, similar signs of toxicity were observed, which were generally more severe and longer lasting. Deaths unrelated to treatment were seen at 300 mg/kg bw, the lowest dose tested. There was no evidence of toxicity after dermal treatment at 2000 mg/kg bw. Slight dyspnoea and ruffled fur were the only findings after inhalation, and these had resolved within 24 h. Teflubenzuron had no clear effect on gross pathological findings in these studies.
Chronic toxicity: Long-term repeated dose toxicity was studied in dogs. In a one-year (52 weeks) chronic toxicity study, dogs were fed diets containing 0, 30, 100 or 500 mg/kg feed, equal to 0, 1, 3.2 or 17.3 mg/kg bw/day in males and 0, 1, 2, 4 or 18 mg/kg bw/day in females.
Based on increased liver weights in the high dose group the NOEL was 100mg/kg feed, equal to 3.2 mg/kg bw/day

Reproductive effects: There was no evidence of toxicity and no effects on reproductive performance The NOAEL was > 500 ppm, equal to 40 mg/kg bw per day.

Teratogenic effects: There were no treatment-related signs of maternal toxicity or any treatment-related teratogenic or fetotoxic effects. The NOAEL for both dams and fetuses was 1000 mg/kg bw per day

Mutagenic effects: The results of tests for the genotoxicity of teflubenzuron revealed no evidence for mutagenicity or clastogenicity.

Carcinogenic effects: In a 120-week study of toxicity and carcinogenicity, There was no evidence of carcinogenicity.

Organ toxicity: teflubenzuron is not a potent cholinesterase inhibitor.

Sensisation: The potential of teflubenzuron to sensitize skin was investigated in the guinea-pig (Dunkin-Hartley) maximization test, The results of two topical challenges after intradermal or topical induction with the test substance indicated that teflubenzuron did not sensitize skin under these conditions

12. Ecological And Ecotoxicological Information

Effects on birds: Birds Acute oral LD50 for quail >2250 mg/kg. Dietary LC50 for quail and ducks >5000 mg/kg.

Effects on aquatic organisms: LC50 (96 h) for trout and carp >500 mg/l.

Effects on other organisms: Non-toxic to bees when used at recommended rates, LD50 (topical) >1000 mg/bee. Low toxicity to predatory arthropods.

13. Disposal Considerations

Dispose of in compliance with all state and local haws and regulation.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read
and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.