Hexaflumuron

(Technical Fact Sheet)
For general information please refer to the General Fact Sheet

What is hexaflumuron?
- Hexaflumuron is a termiticide first registered in the United States in 1994.
- This chemical is used as part of a termite inspection, monitoring, and baiting system.
- It is the first active ingredient registered with the EPA as a reduced-risk pesticide. A reduced risk pesticide is one the EPA believes poses less risk to human health and the environment than existing alternatives (1).

What is the mechanism of action of hexaflumuron?
- Hexaflumuron is an insect growth regulator (IGR) that works by inhibiting the insect’s growth. It interferes with chitin synthesis, which termites need to form a new exoskeleton.
- Hexaflumuron is part of a pest monitoring system and is used selectively only in baiting stations where termite activity is present and only when the activity continues. Termites are social insects that share food and feeding sites. Foraging termites recruit nestmates to feeding sites by leaving a pheromone trail to the site, allowing the entire nest to feed on the bait containing hexaflumuron.
- Pest control operators use hexaflumuron as part of aboveground and underground baiting systems. They place it in a tamper-resistant bait station where foraging termites consume it.

Will I be exposed to hexaflumuron?
- Manufacturers impregnate hexaflumuron in a bait matrix at a 0.5% concentration and then enclose it in a tamper-resistant bait station. It is added to the station only after evidence of termite foraging is detected. This virtually guarantees no exposure, drift, or ground or surface water contamination (1). Only a qualified pest control company can apply this chemical.
- It is unlikely that humans, pets, or non-target species will be exposed.
What is the toxicity of hexaflumuron?

Animals
- Hexaflumuron has a low toxicity to rats when they ingest it. The oral LD$_{50}$ for male and female rats is > 5000 mg/kg (2). See Laboratory Testing box and boxes on LD$_{50}$ and Toxicity Categories.
- Hexaflumuron is non-irritating to rabbit’s skin and eyes (3).

Humans
- Based on its oral LD$_{50}$ in laboratory animals, hexaflumuron is considered to be of very low toxicity to humans. See box on Toxicity Categories. Scientists do not consider it a skin sensitizer (2).

Does hexaflumuron break down and leave the body?

Animals
- Researchers have no current information about the way animals metabolize or excrete hexaflumuron.

Humans
- Researchers have no current information about the way humans metabolize or excrete hexaflumuron.

Is hexaflumuron a carcinogen?

Animals
- Rats and mice fed up to 500 mg/kg/day for 104 weeks do not develop cancer (2). See Cancer box (page 3).

Humans
- Based on the results of animal studies, hexaflumuron is not expected to increase the risk of cancer in humans (2).

Does hexaflumuron cause reproductive or teratogenic effects?
- Since there is very limited potential for human exposure to hexaflumuron, EPA does not require developmental testing at this time (2).

What is the environmental fate and behavior of hexaflumuron?
- Hexaflumuron does not penetrate or translocate into plant or fruit tissue (5).
- In anaerobic soil hexaflumuron has a half-life ranging from 40-64 days (5). See Half-life box (page 3).
Hexaflumuron has low mobility in the soil. It binds strongly to soil particles and is not highly soluble in water. Therefore, it is not likely to contaminate surface or groundwater (5).

Based on use pattern, hexaflumuron is not expected to present a groundwater hazard (2).

What effects does hexaflumuron have on wildlife?

- Hexaflumuron is determined to be highly toxic to aquatic invertebrates, based on a 0.1 ppb LD_{50} in *Daphnia magna*. However, based on the use pattern, these hazards are unlikely to occur in the environment (2, 6).

- Hexaflumuron is virtually non-toxic to birds based on the oral LD_{50} > 2000 mg/kg/day (2).

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References
2. *Pesticide Fact Sheet*; EPA737-F-94-012; U. S. Environmental Protection Agency, Office of Pesticide Programs, U. S.
7. Safety Information Resource Inc.

Cancer: The U.S. EPA has strict guidelines that require testing of pesticides for their potential to cause cancer. These studies involve feeding laboratory animals large *daily* doses of the pesticide over most of the lifetime of the animal. Based on these tests, and any other available information, EPA gives the pesticide a rating for its potential to cause cancer in humans. For example, if a pesticide does not cause cancer in animal tests at large doses, then the EPA considers it unlikely the pesticide will cause cancer in humans. Testing for cancer is not done on human subjects.

**Half-life** is the time required for half of the compound to degrade.

<table>
<thead>
<tr>
<th>Half-life</th>
<th>Degradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 half-life</td>
<td>50% degraded</td>
</tr>
<tr>
<td>2 half-lives</td>
<td>75% degraded</td>
</tr>
<tr>
<td>3 half-lives</td>
<td>88% degraded</td>
</tr>
<tr>
<td>4 half-lives</td>
<td>94% degraded</td>
</tr>
<tr>
<td>5 half-lives</td>
<td>97% degraded</td>
</tr>
</tbody>
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Remember that the amount of chemical remaining after a half-life will always depend on the amount of the chemical originally applied.

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