



Endosulfan

Updated: May 2019

CAS No. 115-29-7

Endosulfan is a pesticide. It is a cream-to-brown-colored solid that may appear crystalline or in flakes. It is sold as a mixture of two different forms of the same chemical (referred to as α - and β -endosulfan). It has a distinct odor similar to turpentine [ATSDR].

Usage and exposure

Endosulfan is an organochlorine insecticide and acaricide. It acts as a contact poison for a wide variety of insects, like aphids, cabbage worms, and ticks. In addition to its application on food crops, endosulfan can be utilized as a wood preservative as well. Endosulfan is gradually being phased out on a global scale due to the wide array of health complications associated with its usage [Pesticides. News].

Endosulfan is particularly effective against aphids, fruit worms, beetles, leafhoppers, moth larvae, and white flies on a wide variety of crops. It is not approved for residential use. The use of endosulfan is being restricted by more than 80 countries. In 2012 the use of endosulfan to certain crops in USA was scheduled to be canceled for all uses by 2016. The restricted use classification requires that registered products may only be applied by a "certified pesticide applicator" or under the direct supervision of a certified pesticide applicator [ATSDR].

Endosulfan can be released into the air, water, and soil in areas where it is applied as a pesticide [ATSDR].

Endosulfan residues can be present in food [ATSDR].

Routs of exposure

Inhalation, skin absorption, ingestion, skin and/or eye contact

Dietary intake is expected to be the main source of endosulfan exposure to the general population. Exposure will also occur, although to a much lesser extent, by breathing contaminated air or drinking contaminated water or by touching fruits or plants that have been sprayed with endosulfan [ATSDR].

Exposure of workers can occur during the manufacture of endosulfan [ToxGuide].

Farm workers are expected to be exposed to higher amounts of endosulfan compared to the general population. These exposures may occur through direct handling and application or through exposure in fields that were previously sprayed (occupational re-entry) [ATSDR].

In addition to individuals who are occupationally exposed to endosulfan, there are several groups within the general population that have potentially high exposures (higher than background levels). These populations include individuals living in the proximity of sites where endosulfan was produced or sites where endosulfan was disposed of [ATSDR].

Target organs

Central nervous system

Metabolism

There is indirect evidence that humans absorb endosulfan by the inhalation and/or dermal routes, but there is conclusive of gastrointestinal absorption; the extent of absorption is not known. In humans, endosulfan appears to accumulate in the liver, kidney, and brain, at least in the short term. Endosulfan and metabolites have been detected in the urine of humans after ingestion of the chemical [ToxGuide].

The primary biomarkers for endosulfan exposure include tissue and excreta concentrations of endosulfan and its metabolite endosulfan sulfate [ToxGuide].

Health hazards

As an organochlorine compound, endosulfan can cause organochlorine compound poisoning. The symptoms of this include: dizziness, headache, hyperexcitability, incoordination, mental confusion, nausea, tremors, vomiting [Pesticides. News].

Severe organochlorine compound poisoning can lead to more serious symptoms, primarily: coma, convulsions, respiratory depression, seizures [Pesticides. News].

References

- ATSDR, Agency for Toxic Substances & Disease Registry. Public Health Statement for Endosulfan. <https://www.atsdr.cdc.gov/phs/phs.asp?id=607&tid=113>
- CDC, Centers for Disease Control and Prevention. NIOSH Pocket Guide to Chemical Hazards. Endosulfan. <https://www.cdc.gov/niosh/npg/npgd0251.html>.
- ToxGuide Endosulfan. Agency for Toxic Substances & Disease Registry. <https://www.atsdr.cdc.gov/toxguides/toxguide-41.pdf>
- Pesticides. News. Endosulfan — toxicity, side effects, diseases and environmental impacts. <https://www.pesticides.news/2017-12-02-endosulfan-toxicity-side-effects-diseases-and-environmental-impacts.html>