Sources of Exposure

General Populations

- Exposure to methoxychlor may occur via inhalation, ingestion, or dermal absorption.
- Most members of the general population have little or no exposure to methoxychlor.
- Generally, methoxychlor is not detected in food, but higher levels have been infrequently reported in fish. From 1986 to1991 the average dietary intake of methoxychlor was reported to be 0.1 to 0.3 ng/kg/day.
- Populations that live near farms that use methoxychlor-containing products may have higher exposure levels, however, all registered technical sources of methoxychlor have been cancelled.

Occupational Populations

- Farmers and pesticide applicators that use methoxychlor are likely to receive above average exposures.
- Workers in methoxychlor-production plants may also be exposed.

Toxicokinetics and Normal Human Levels

Toxicokinetics

- Methoxychlor is readily absorbed from the gastrointestinal tract and to a lesser extent through the skin.
- Once absorbed, methoxychlor is distributed to most tissues of the body with the highest levels usually found in fat tissue.
- Methoxychlor is quickly metabolized in the liver and does not bioaccumulate in fat or other tissues.
- The major pathway by which methoxychlor is metabolized is demethylation by cytochrome P-450 enzymes to form phenolic metabolites.
- Ingested methoxychlor and its metabolites are eliminated primarily through the feces

Normal Human Levels

- No data available.

Biomarkers/Environmental Levels

Biomarkers

- Methoxychlor and its metabolites detected in feces or breast milk may indicate high recent exposures.
- There are no specific biomarkers of effects for methoxychlor.

Environmental Levels

Air

- A survey of several U.S. cities showed ambient methoxychlor levels ranging from not detect to 7 ng/m^3.
- Air levels tend to be higher during insect control periods.

Sediment and Soil

- Methoxychlor is infrequently detected in sediment and soil except in areas where it has been applied as a pesticide.

Water

- Methoxychlor is not commonly detected in surface, ground, or drinking waters.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Methoxychlor (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

$C_{16}H_{15}Cl_3O_2$

ToxGuide™ for Methoxychlor

$C_{16}H_{15}Cl_3O_2$

CAS# 72-43-5

September 2002

U.S. Department of Health and Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry
www.atsdr.cdc.gov

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Chemical and Physical Information

Methoxychlor is a crystalline solid

- Methoxychlor is a pale yellow crystalline solid and can have a slightly fruity, musty, and chlorine-like odor.
- Trade names for methoxychlor include Prentox®, Methoxycide®, Marlate®, and Metox®.
- Methoxychlor was used as a component in formulated pesticide products as wettable powders, dust, granules, emulsifiable concentrates, liquid soluble concentrates, ready-to-use liquid products, and pressurized liquids.
- Methoxychlor release to the environment is mainly as a result of its application to crops and livestock as a pesticide.

Routes of Exposure

- Inhalation – Minor route of exposure for the general population., but is an important route for occupational exposure.
- Oral – The most likely route of exposure is the ingestion of food with low-level contamination.
- Dermal – An important route of exposure is dermal contact which may occur when using methoxychlor-containing products.

Methoxychlor in the Environment

- Methoxychlor is not found naturally in the environment.
- Methoxychlor exists in air in both as a particulate and to a lesser degree, vapor phase.
- Methoxychlor in water and sediment is degraded to dechlorinated, dehydrochlorinated and demethylated products by chemical, photochemical and biological processes.
- Once deposited on the ground, methoxychlor becomes bound to the soil, and does not tend to move rapidly.
- Methoxychlor bio-concentrates in aquatic organisms including microorganisms, snails, clams, and some fish, but does not bio-accumulate in fish and animals that are capable of quickly metabolizing it.

Relevance to Public Health (Health Effects)

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

Minimal Risk Levels (MRLs)

Inhalation

- No acute-, intermediate-, or chronic-duration inhalation MRLs were derived for methoxychlor.

Oral

- An MRL of 0.005 mg/kg/day has been derived for intermediate-duration oral exposure (15–364 days).
- No acute- or chronic- duration oral MRLs were derived for methoxychlor.

Health Effects

- The primary and most sensitive target of toxicity is the reproductive system with effects consistent with the disruption of normal endocrine activities and may result in altered estrus cycles, reduced fertility, along with other reproductive effects.
- Gestational exposure to methoxychlor may impair normal development of the reproductive system in the offspring.
- Exposure to high doses of methoxychlor can produce neurological effects including apprehension, nervousness, increased salivation, tremors, convulsions, decreased locomotor activity, and even death.
- Both IARC and US EPA have determined that methoxychlor is not classifiable as to its carcinogenicity to humans.

Children's Health

- Currently, it is not known whether children differ from adults in their susceptibility to methoxychlor.