

According to the UN GHS revision 8

Creation Date: April 22, 2026

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1. IDENTIFICATION

1.1 GHS Product identifier

Product name: Estradiol

Catalog Number: T1048

CAS Number: 50-28-2

1.2 Other means of identification

Other names: -

1.3 Recommended use of the chemical and restrictions on use

Identified uses: no data available

1.4 Supplier's details

Company: Targetmol Chemicals Inc.

Address: 34 Washington Street, Wellesley Hills, Massachusetts 02481 USA

Tel/Fax: (781) 999-4286

1.5 Emergency phone number

Emergency phone number: 781-999-4286

Service hours: Monday to Friday, 9am-5pm (Standard timezone: UTC/GMT -5 hours).

2. HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Carcinogenicity, Category 2

Reproductive toxicity, Category 1A

Reproductive toxicity, Additional category for effects on or via lactation

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

2.2 GHS label elements, including precautionary statements

Pictogram(s):



Signal word:

Danger

Hazard statement(s):

H351 Suspected of causing cancer

H360 May damage fertility or the unborn child

H362 May cause harm to breast-fed children

H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s):

P203 Obtain, read and follow all safety instructions before use.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Prevention:

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P263 Avoid contact during pregnancy and while nursing.

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

	P273 Avoid release to the environment.
Response:	P318 IF exposed or concerned, get medical advice. P391 Collect spillage.
Storage:	P405 Store locked up.
Disposal:	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number
Estradiol	-	50-28-2	200-023-8

4. FIRST-AID MEASURES

4.1 Description of necessary first-aid measures

General advice

no data available

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Poisons A and B

4.3 Indication of immediate medical attention and special treatment needed, if necessary

no data available

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Use dry chemical, carbon dioxide or alcohol-resistant foam.

5.2 Specific hazards arising from the chemical

no data available

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Do not store unpouched. Apply immediately upon removal from the protective pouch.

Keep away from direct sunlight, Store under nitrogen
Powder: -20°C for 3 years | In solvent: -80°C for 1 year

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid
Color	White
Odour	Odorless
Melting point/freezing point	28°C(lit.)

Boiling point or initial boiling point and boiling range	193°C/2.5mmHg(lit.)
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	47°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	H2O: <1 mg/mL (insoluble) Ethanol: 20.4 mg/mL (74.9 mM),Sonication is recommended. DMSO: 250 mg/mL (917.84 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
N-octanol-water partition coefficient	no data available
Vapour pressure	6.38X10 ⁻⁹ mm Hg at 25 deg C (est)
Density and/or relative density	1.17g/cm ³
Relative vapour density	no data available
Particle characteristics	no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

no data available

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

A carcinogen.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and irritating fumes.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral: no data available
Inhalation: no data available
Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is sufficient evidence in humans for the carcinogenicity of post-menopausal estrogen therapy. There is sufficient evidence in experimental animals for the carcinogenicity of estradiol and estrone. There is limited evidence in experimental animals for the carcinogenicity of conjugated equine estrogens, equilin and estriol. There is inadequate evidence in experimental animals for the carcinogenicity of d-equilenin. Overall evaluation: Post-menopausal estrogen therapy is carcinogenic to humans (Group 1). Post-menopausal estrogen therapy

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish: EC50; Species: Danio rerio (Zebra danio, age 6-8 month adult, female); Conditions: freshwater, renewal, 25-28 deg C, pH 8.0-8.5, hardness 140-145 mg/L CaCO₃; Concentration: 0.88 nM for 3 weeks; Effect: morphology, decreased ovarian weight in relationship to body weight /98% purity

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water flea, age <24 hr neonate newly released); Conditions: freshwater, static, 20 deg C; Concentration: 1550 ug/L for 24 hr (95% confidence interval: 1050-2040 ug/L); Effect: development, decreased molting /100% purity, 17beta-estradiol

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: 4-¹⁴C-labeled estradiol, present at 1.5 mg/L, was 6% mineralized in 5 days after application to a microcosm employing 210 g of agricultural soil (Hamar soil: 2.23% organic matter, 14.0% clay, 19.0% silt, 67% sand) in 250 mL flasks(1). 17beta-Estradiol is 85-90% removed by conventional wastewater treatment, occurring mainly through sorption to sludge followed by biodegradation. Conjugated estrogens are hydrolyzed into free estrogens and glucuronide/sulfuric acid in the presence of Escherichia coli(2). Mineralization of estrogens may be enhanced by up to 147% or depressed up to 50%, depending on soil and organic waste(3).

12.3 Bioaccumulative potential

An estimated BCF of 200 was calculated in fish for estradiol(SRC), using a log K_{ow} of 4.01(1) and a regression-derived equation(2). An estimated log BCF of 2.65 was calculated in fish for estradiol using a food-web model(3), corresponding to a BCF of 450(SRC). According to a classification scheme(4), this BCF suggests the potential for bioconcentration in aquatic organisms is high(SRC), provided the compound is not metabolized by the organism(SRC).

12.4 Mobility in soil

Using a Drummer soil from Indiana (pH 7.1, 2.91% organic carbon, 21% clay, 13% sand, 66% silt), a log K_{oc} of 3.45 (Freundlich constant K_d 83.2) was measured(1), corresponding to a K_{oc} of 3,000(SRC). According to a classification scheme(2), this estimated K_{oc} value suggests that estradiol is expected to be immobile in soil. K_d values of 476 have been reported for estradiol in activated sludge wastewater treatment systems; it was estimated that as much as 66% of estradiol is absorbed to sludge and 0.24% sorbed to suspended particles during waste water treatment(3). Estradiol sorption was shown to increase with the amount of incorporated organic waste. In soils with an extensive history of organic waste treatments, soil organic carbon content is the controlling factor for estrogen sorption(4).

12.5 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. TRANSPORT INFORMATION

14.1 UN Number

no data available

14.2 UN Proper Shipping Name

no data available

14.3 Transport hazard class(es)

no data available

14.4 Packing group, if applicable

no data available

14.5 Environmental hazards

no data available

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)	Listed.
EC Inventory	Listed.
United States Toxic Substances Control Act (TSCA) Inventory	Not Listed.
China Catalog of Hazardous chemicals 2015	Not Listed.
New Zealand Inventory of Chemicals (NZI ^o C)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Not Listed.

16. OTHER INFORMATION

Information on revision

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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_l°Cale=en
CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

no data available

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