1. PRODUCT AND COMPANY IDENTIFICATION

Product name: β-Estradiol
Product Number: E8975
Brand: Sigma
Supplier: Sigma Aldrich
Telephone: +1 800-355-3552
Emergency Phone #: (314) 776-3552
Preparation Information: Sigma Aldrich Corporation

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards: Target Organ Effect, Carcinogen, Teratogen, Reproductive hazard, Mutagen

Target Organ: Female reproductive system, Male reproductive system

GHS Classification
Genotoxicity (Category 1A): May cause genetic defects.
Carcinogenicity (Category 1B): May cause cancer.
Mutagenicity (Category 1B): Suspected of damaging fertility or the unborn child.
Reproductive toxicity (Category 2): May cause birth defects.
Acute aquatic toxicity (Category 1): Very toxic to aquatic life.

GHS Label elements, including precautionary statements

Pictogram: A
Signal word: Danger

Hazard statement(s):
H340: May cause genetic defects.
H350: May cause cancer.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.

Precautionary statement(s):
P251: Use personal protective equipment as required.
P308 + P313: If exposed or concerned: Get medical advice/attention.
P273: Avoid release to the environment.
P201: Obtain special instructions before use.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: 3,17β-Dihydroxy-1,3,5(10)Estratriene
13β,3,17β-Estratriene-3,17β-diol
Dihydrolflolizin
17β-Estradiol

Formula: C18H22O2
Molecular Weight: 272.38 g/mol

CAS-No: 50-28-2
EC-No: 200-023-8
Index No: 200-203-8
Concentration: 100%

4. FIRST AID MEASURES

General Advice:
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If Inhaled:
If breathed in, move into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact:
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact:
Flush eyes with water as a precaution.

If swallowed:
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Conditions of flammability:
Not flammable or combustible.

Suitable extinguishing media:
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Protection equipment for fire-fighters:
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products:
Hazardous decomposition products formed under fire conditions: Carbon oxides.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
### 7. HANDLING AND STORAGE

#### Precautions for safe handling
- Avoid contact with skin and eyes. Avoid breathing dust. Do not inhale dust or spray. Do not eat, drink, or smoke in the area.
- Wear appropriate protective clothing and equipment.
- Do not mix with other chemicals.
- Store in a cool, dry place.

#### Conditions for safe storage
- Keep container tightly closed.
- Store in a dry, well-ventilated place.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Personal protective equipment
- Eye protection: Safety glasses with side shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or CE (EU).
- Skin protection: Wear thick gloves made of a material selected according to the concentration and amount of the dangerous substance at the specific workplace.
- Hand protection: Gloves made of a material selected according to the concentration and amount of the dangerous substance at the specific workplace.
- Respiratory protection: Use a respiratory device that meets appropriate government standards such as NIOSH (US) or EN149 (EU).

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### Appearance
- Colour: White
- Odour: No data available
- Temperature: No data available
- Lower explosivity limit: No data available
- Upper explosivity limit: No data available
- Vapour pressure: No data available
- Density: No data available
- Water solubility: No data available
- Partition coefficient: No data available
- Melting point: No data available
- Boiling point: No data available
- Flash point: No data available
- Autoignition temperature: No data available

#### Chemical stability
- Stable under recommended storage conditions.
- Compatibility: No data available
- Instability: No data available

#### Reactivity
- Reactivity: No data available
- Stability: No data available
- Possibility of hazardous reactions: No data available
- Conditions to avoid: No data available

#### Hazardous decomposition products
- Hazardous decomposition products: No data available
- Other hazards: No data available

#### Material safety data sheet
- Acute toxicity: No data available
- Skin corrosion/irritation: No data available
- Sensitive to skin: No data available
- Respiratory or skin sensitization: No data available
- Germ cell mutagenic: No data available
DNA damage
Gerotoxicity in vivo - rat - Oral
Morphological transformation.

Carcinogenicity
The National Toxicology Program (Tenth Report on Carcinogens) has determined that steroidal estrogens are known to be human carcinogens based on sufficient evidence of carcinogenicity in humans, which indicates a causal relationship between exposure to steroidal estrogens and human cancer. This includes a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
May cause reproductive disorders.

Teratogenicity

Suspected human reproductive toxicant. Damage to fetus cannot be excluded.

Specific target organ toxicity - single exposure (Globally Harmonized System)
No data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
No data available

Aspiration hazard
No data available

Potential health effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.

Ingestion: May be harmful if swallowed.

Skin: May be harmful if absorbed through skin. May cause skin irritation.

Eyes: May cause eye irritation.

Sensitization and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
No data available

Additional information
RTECS: KG2975500

12. ECOLOGICAL INFORMATION
Toxicity
Toxicity to fish
LC50 - Oryzias latipes - 0.002 μg/l - 96 h

13. DISPOSAL CONSIDERATIONS
Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION
DOT (US)
Not a hazardous material

IMDG
UN number: 3077 Class: 3 Packing group: II
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Estradiol)
Marine pollutant: Marine pollutant

IATA
UN number: 3077 Class: 3 Packing group: II
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Estradiol)

Further information
EHS Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5 L for liquids or > 5 kg for solids.

15. REGULATORY INFORMATION
OSHA Hazards
Target Organ Effect, Carcinogen, Teratogen, Reproductive hazard, Mutagen

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

Estradiol
CAS-No: 50-28-2
Revision Date: 1992-04-24

Pennsylvania Right To Know Components

Estradiol
CAS-No: 50-28-2
Revision Date: 1992-04-24
16. OTHER INFORMATION

Further Information
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product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the
product. Sigma-Aldrich Co. shall not be held liable for any damage resulting from handling or from contact with the
above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.