

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 3090
SRM Name: Aroclors in Transformer Oil
Other Means of Identification: Not Applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a set of six different solutions of individual Aroclors in transformer oil and consists of six 2-mL ampoules, each containing approximately 1.2 mL of each of the following SRMs: SRM 3075, Aroclor 1016 in Transformer Oil; SRM 3076, Aroclor 1232 in Transformer Oil; SRM 3077, Aroclor 1242 in Transformer Oil; SRM 3078, Aroclor 1248 in Transformer Oil; SRM 3079, Aroclor 1254 in Transformer Oil; and SRM 3080, Aroclor 1260 in Transformer Oil. This SRM is intended primarily for calibrating chromatographic instrumentation and methods of analysis used for the determination of Aroclors and polychlorinated biphenyls (PCBs) in transformer oil.

Company Information

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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Carcinogenicity Category 1B
Reproductive Toxicity Category 2
Aspiration Hazard Category 1

Label Elements

Symbol



Signal Word

DANGER

Hazard Statement(s)

H304 May be fatal if swallowed and enters airways.
H350 May cause cancer <inhalation, ingestion>.
H361 Suspected of damaging fertility or the unborn child.

Precautionary Statement(s):

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P280 Wear protective gloves, protective clothing, and eye protection.

P308+P313 If exposed or concerned: Get medical attention.

P301+P310 If swallowed: Immediately call a doctor.

P331 Do NOT induce vomiting.

P405 Store locked up.

P501 Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Aroclor 1260 in transformer oil.

Other Designations:

Transformer oil (hydrotreated light naphthenic distillate (petroleum), hydraulic petroleum oil, distillates, petroleum).

Aroclor 1232: PCB 1232; chlorodiphenyl (32 % Cl); polychlorinated biphenyl; chlorobiphenyls; PCB; PCBs.

Aroclor 1242: PCB 1242; chlorodiphenyl (42 % Cl); polychlorinated biphenyl; chlorobiphenyls; PCB; PCBs.

Aroclor 1248: PCB 1248; chlorodiphenyl (48 % Cl); polychlorinated biphenyl; chlorobiphenyls; PCB; PCBs.

Aroclor 1254: PCB 1254; chlorodiphenyl (54 % Cl); polychlorinated biphenyl; chlorobiphenyls; PCB; PCBs.

Aroclor 1260: PCB 1260; chlorodiphenyl (60 % Cl); polychlorinated biphenyl; chlorobiphenyls; PCB; PCBs.

Components are listed in compliance with OSHA 29 CFR 1910.1200.

| Hazardous Component(s) | CAS Number | EC Number ^(a) (EINECS) | Nominal Mass Concentration (%) |
|------------------------|------------|--------------------------------------|-----------------------------------|
| SRM 3075 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | >99.99 |
| SRM 3076 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | balance |
| Aroclor 1232 | 11141-16-5 | 215-648-1 | 0.43 |
| SRM 3077 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | balance |
| Aroclor 1242 | 53469-21-9 | 215-648-1 | 0.41 |
| SRM 3078 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | balance |
| Aroclor 1248 | 12672-29-6 | 215-648-1 | 0.37 |
| SRM 3079 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | balance |
| Aroclor 1254 | 11097-69-1 | 215-648-1 | 0.36 |
| SRM 3080 | | | |
| Transformer Oil | 64742-53-6 | 265-156-6 | balance |
| Aroclor 1260 | 11096-82-5 | 215-648-1 | 0.11 |

^(a) EC Number as PCB, polychlorinated biphenyl

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash exposed skin with soap and water for at least 15 minutes. Seek medical attention if needed.

Eye Contact: Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: Aspiration hazard. Do not induce vomiting. If vomiting occurs, keep head lower than hips to prevent aspiration. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Irritation, dizziness, nausea, coughing, and aspiration.

Indication of any immediate medical attention and special treatment needed, if necessary: Not applicable.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Slight fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Regular dry chemical, carbon dioxide, regular foam.

Unsuitable: Straight streams of water.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2

Fire = 1

Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Absorb spilled material with sand or non-combustible material and collect in appropriate container for disposal. Keep out of water supplies and sewers.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. The storage floor must be impermeable and form a collecting basin so that, in the event of an accident spillage, the liquid cannot spread beyond the storage area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Transformer oil: No occupational exposure limits established.

Aroclors: NIOSH (TWA): 0.001 mg/m³ (related to 1,1'-Biphenyl, chloro derivatives)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection Measures: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties

| | |
|--|---|
| Appearance (physical state, color, etc.): | Transformer oil (>99 %) clear, yellow liquid |
| Molecular Formula: | not applicable |
| Molar Mass (g/mol): | not applicable |
| Odor: | not available |
| Odor threshold: | not available |
| pH: | not available |
| Evaporation rate: | not available |
| Melting point/freezing point: | -55 °C (-67 °F) |
| Pour point: | -40 °C (-40 °F) |
| Density: | 0.8912 g/mL at 22 °C ^(b) |
| Vapor Pressure: | 0.1 mmHg 20 °C ^(a) |
| Vapor Density (air = 1): | >5 at 101 kPa ^(a) |
| Kinematic Viscosity: | 12 cSt (12 mm ² /s) at 40 °C |
| Solubility(ies): | insoluble in water |
| Partition coefficient (n-octanol/water): | >6.5 ^(a) |

Thermal Stability Properties

| | |
|---|-------------------------------------|
| Autoignition Temperature: | >315 °C (599 °F) ^(a) |
| Thermal Decomposition: | not available |
| Initial boiling point and boiling range: | 260 °C to 371 °C (500 °F to 700 °F) |
| Explosive Limits, LEL: | not available |
| Explosive Limits, UEL: | not available |
| Flash Point: | >145 °C (293 °F) ^(a) |
| Flammability (solid, gas): | not applicable |

^(a) Physical property listed in the NIST Certificate of Analysis. Values are not certified.

^(b) Vendor supplied health and safety information.

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid excessive heat; high energy ignition sources.

Incompatible Materials: Oxidizers.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of carbon, sulfur oxides, aldehydes.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Dizziness, nausea, coughing.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute exposure to high levels of vapor from transformer oil may cause central nervous system depression, headache, dizziness, nausea, vomiting, anorexia, incoordination and unconsciousness. Prolonged or repeated exposure may cause irritation. Short term exposure to Aroclors may cause irritation or liver damage; long term exposure may cause rash, itching, hair loss, digestive issues, headache, dizziness, impotence, coma, and cancer.

Skin Contact: Short term and long term contact with transformer oil may cause skin irritation and dermatitis. Short-term exposure to Aroclors may cause skin irritation or liver damage; long term exposure to Aroclors may cause same effects as for inhalation, plus hair loss and reproductive effects.

Eye Contact: Acute exposure of liquid or vapor may cause irritation.

Ingestion: Acute ingestion of transformer oil may cause abdominal pain, nausea, and vomiting. Small amounts of oil aspirated during ingestion or vomiting may cause lung damage; no information available for long-term exposure to transformer oil. Short term exposure to Aroclors may cause liver damage; long term exposure to Aroclors may cause same effects as for inhalation, plus hyperactivity, menstrual disorders, reproductive effects.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.

Component: Transformer oil

Rat, Oral LD50: >5000 mg/kg

Rat, Inhalation LC50: 2180 mg/m³ (4 h)

Rabbit, Skin LD50: >2000 mg/kg

Component: Aroclor 1232

Rat, Oral LD50: 4470 mg/kg

Component: Aroclor 1242

Rat, Oral LD50: 4250 mg/kg

Component: Aroclor 1248

Rat, Oral LD50: 11000 mg/kg

Component: Aroclor 1254

Rat, Oral LD50: 1010 mg/kg

Component: Aroclor 1260

Rat, Oral LD50: 1315 mg/kg

Skin Corrosion/Irritation: Not classified.

Transformer oil, Rabbit, skin: 0.5 mL/24 h, moderate

Serious Eye Damage/ Eye Irritation: Not classified.

Transformer oil, Rabbit, eye: 0.1 mL, mild

Respiratory Sensitization: No data available; not classified.

Skin Sensitization: No data available; not classified.

Germ Cell Mutagenicity: No data available; not classified.

Carcinogenicity: Category 1B

Listed as a Carcinogen/Potential Carcinogen X Yes No

Transformer oil is not listed by NTP, IARC, or OSHA as a carcinogen/potential carcinogen.

Aroclors are listed by NTP as *reasonably anticipated to be a human carcinogen* (as PCB, polychlorinated biphenyl, CAS number 1336-36-3) and by IARC as Group 1, *carcinogenic to humans* (related to Polychlorinated biphenyls).

Reproductive Toxicity: Category 2

Aroclors: Overexposure has resulted in decreased birth weight in offspring of exposed mothers. Significant exposure to PCBs that reach the fetus can cause teratogenic effects.

Component: Aroclor 1232

Oral Rat TDLo: 420 mg/kg TDLo (21 days)

Component: Aroclor 1242

Oral Rat TDLo: 945 mg/kg TDLo (prior to copulation, 36 week)

Component: Aroclor 1248

Monkey, Oral TDLo: 32 mg/kg (pregnant 1-23 week, 91 days)

Component: Aroclor 1254

Oral Mammal TDLo - species unspecified: 14 mg/kg, prior to copulation 30 day(s)

Component: Aroclor 1260

Oral Rat TDLo: 210 mg/kg, pregnant 14-20 days

STOT, Single Exposure: No data available; not classified.

STOT, Repeated Exposure: Not classified; this SRM contains less than 1 % of Aroclor, a Category 2 target organ toxicant.

Aspiration Hazard: Category 1

Transformer oil is a human aspiration toxicity hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Transformer oil: Fish, Rainbow Trout (*Oncorhynchus mykiss*) LC50: >5000 mg/L (96 h)
Invertebrate, Water flea (*Daphnia magna*) EC50: >1000 mg/L (48 h)
Aroclor 1232: No data available.
Aroclor 1242: Fish, Fathead minnow (*Pimephales promelas*) LC50 (flow-through, newly hatched): 0.015 mg/L (96 h)
Aroclor 1248: No data available.
Aroclor 1254: No data available.
Aroclor 1260: No data available.

Persistence and Degradability: Has the potential to biodegradable.

Bioaccumulative Potential: No data available

Mobility in Soil: Expected to migrate from land to water and vice versa.

Other Adverse effects: Keep out of water supplies.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: This material is not regulated by IATA or DOT.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Aroclors 1 lb. (0.454 kg) final RQ.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Aroclors, 0.1 % supplier notification limit (related or polychlorinated biphenyls).

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

| | |
|-----------------|------|
| ACUTE HEALTH: | Yes. |
| CHRONIC HEALTH: | Yes. |
| FIRE: | No. |
| REACTIVE: | No. |
| PRESSURE: | No. |

State Regulations:

California Proposition 65:

WARNING! This product contains a chemical (Aroclors 1232, 1242, 1248, 1254 and 1260, related to PCBs) known to the state of California to cause cancer, reproductive, and/or developmental effects.

U.S. TSCA Inventory: Transformer oil is listed.

TSCA 12(b), Export Notification: Aroclors 1232, 1242, 1248, 1254 and 1260 is listed in Section 6, 50 ppm de minimus concentration (see 40 CFR 761, related to polychlorinated biphenyls).

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 27 May 2015

Sources: ChemADVISOR, Inc., SDS, *Aroclor 1232*, 20 March 2015

ChemADVISOR, Inc., SDS, *Aroclor 1242*, 20 March 2015

ChemADVISOR, Inc., SDS, *Aroclor 1248*, 20 March 2015

ChemADVISOR, Inc., SDS, *Aroclor 1254*, 20 March 2015

ChemADVISOR, Inc., SDS, *Aroclor 1260*, 20 March 2015.

ChemADVISOR, Inc., SDS, *Transformer Oil*, 20 March 2015.

Vendor MSDS, Exxon Mobile Corporation, UNIVOLT N 61 B, 30 May 2014.

Key of Acronyms:

| | | | |
|--------|---|-------|--|
| ACGIH | American Conference of Governmental Industrial Hygienists | NRC | Nuclear Regulatory Commission |
| ALI | Annual Limit on Intake | NTP | National Toxicology Program |
| CAS | Chemical Abstracts Service | OSHA | Occupational Safety and Health Administration |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | PEL | Permissible Exposure Limit |
| CFR | Code of Federal Regulations | RCRA | Resource Conservation and Recovery Act |
| DOT | Department of Transportation | REL | Recommended Exposure Limit |
| EINECS | European Inventory of Existing Commercial Chemical Substances | RQ | Reportable Quantity |
| EPCRA | Emergency Planning and Community Right-to-Know Act | RTECS | Registry of Toxic Effects of Chemical Substances |
| IARC | International Agency for Research on Cancer | SARA | Superfund Amendments and Reauthorization Act |
| IATA | International Air Transportation Agency | SCBA | Self-Contained Breathing Apparatus |
| IDLH | Immediately Dangerous to Life and Health | RM | Reference Material |
| LC50 | Lethal Concentration | STEL | Short Term Exposure Limit |
| LD50 | Median Lethal Dose or Lethal Dose, 50 % | STOT | Specific Target Organ Toxicity |
| LEL | Lower Explosive Limit | TLV | Threshold Limit Value |
| MSDS | Material Safety Data Sheet | TPQ | Threshold Planning Quantity |
| NFPA | National Fire Protection Association | TSCA | Toxic Substances Control Act |
| NIOSH | National Institute for Occupational Safety and Health | TWA | Time Weighted Average |
| NIST | National Institute of Standards and Technology | UEL | Upper Explosive Limit |
| | | WHMIS | Workplace Hazardous Materials Information System |

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.