



MATERIAL SAFETY DATA SHEET

IONEX R-11

Rev.: D 7/25/07

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name R-11
Manufacturer/Supplier IONEX Research Corporation
Address P.O. Box 70
Lafayette, CO 80026
Phone Number (303) 666-5550 (Monday – Thursday, 6:00 am – 4:30 pm MT)
Revision Date: July 25, 2007
MSDS Date: June 25, 2002

This MSDS has been compiled in accordance with - EC Directive 91/155/EC - OSHA's Hazcom Standard (29 CFR 1910.1200)

2. COMPOSITION/INFORMATION ON THE COMPONENTS

Component Name	CAS#/Codes	Weight %
Trichlorofluoromethane	75-69-4	100

3. HAZARD IDENTIFICATION

Emergency Overview: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

Health Effects - Eyes

Irritant. Liquid contact will irritate and may cause conjunctivitis.

Health Effects - Skin

Prolonged and/or repeated contact with this solvent can cause irritation of the skin (defatting of skin).

Health Effects - Ingestion

Discomfort due to volatility would be expected. Some of the inhalation effects could be expected.

Health Effects - Inhalation

R-11 has a relatively low order of acute toxicity. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. In repeated exposure tests with animals, changes were noted in liver functions and lipid production levels above 100 ppm. At high levels, cardiac arrhythmia may occur.

Delayed Effects

None known.

None of the components in this material are listed by NPT, IARC, or OSHA as a carcinogen.



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4. FIRST AID MEASURES

Eyes

Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get medical attention.

Skin

Promptly flush skin with water until all chemical is removed. Remove clothing contaminated with liquid and wash before use.

Ingestion

DO NOT induce vomiting unless instructed to do so by a physician. DO NOT give stimulants. Get medical attention immediately.

Inhalation

Immediately remove patient to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).

Advice to Physicians

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situation of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES

Flash Point:	None
Flash Point Method:	ASTM D-1310-67 and ASTM D-56-82
Autoignition Temperature:	Unknown
Upper/Lower Flame Limit (volume % in air):	None
Flame Propagation Rate (solids):	Not applicable
OSHA Flammability Class:	Not applicable

Extinguishing Media

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable.)

Unusual Fire and Explosion Hazards

Contact with certain finely divided metals may cause exothermic reaction and/or explosive combinations under specific conditions (e.g. very high temperatures and/or appropriate pressures and in the presence of oxygen). Decomposition products include hydrochloric acid, hydrofluoric acid, and carbonyl halides.

Protective Equipment for Fire-Fighting / Precautions / Instructions

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.



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6. ACCIDENTAL RELEASE MEASURES

(Always wear recommended personal protective equipment.)

Immediately evacuate the area and provide maximum ventilation. Try to eliminate all ignition sources. Unprotected personnel should move upwind from spill. Only personnel equipped with proper respiratory and eye/skin protection should be permitted in the area. Dike area to contain the spill. Take precautions as necessary to prevent contamination of ground and surface waters. For large spills, pump material into appropriate containers. For small spills, recover or absorb spilled material using an absorbent designed for chemical spill such as Hazsorb® pillows. Place used absorbents into closed DOT approved containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush into sewer. If the area of the spill is porous, removal of contaminated earth/surface may be required.

Spills and releases may have to be reported to Federal and/or local authorities. See reporting requirements.

7. HANDLING AND STORAGE

Normal Handling: (Always wear recommended personal protective equipment.)

R-11 boils at 74.5°F, hence contents may be under pressure. Exercise caution when opening container. If containers have been stored in direct sunlight or heated above the boiling point of the solvent, the container should be cooled to below the boiling point before opening.

Storage Recommendations:

Keep container closed when not in use. DO NOT store in open, unlabeled or mislabeled containers. Store in a cool, well-ventilated area of low fire risk. Protect container and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty. If container temperature exceeds boiling point, cool the container before opening.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Control Measures

Use local exhaust at filling zones and areas where leakage is probable. Use mechanical (general) ventilation for storage areas. All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94).

Respiratory Protection

None generally required for adequately ventilated work situations. Use NIOSH approved self-contained, positive pressure respirators for emergencies and in situations where air may be displaced by vapors.

Hand/Skin Protection

Use protective, impervious gloves such as PVA or neoprene. Also, use full protective clothing if there is prolonged or repeated contact of liquid with skin. Any non-impervious clothing should be promptly removed when contaminated and washed before reuse.

Eye Protection

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles.



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Additional Recommendations:

High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

Exposure Guidelines

<u>Ingredient Name</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Trichlorofluoromethane	1000 ppm Ceiling	1000 ppm TWA-8	None

Other exposure limits for potential decomposition products:

Hydrogen Fluoride: ACGIH TLV: 3 ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance/Color	Colorless liquid
Odor	Faint ethereal and sweetish odor
Molecular Weight	137.35
Chemical Formula	CCl ₃ F
pH	Neutral
Specific Gravity	1.47 @ 70°F (21.1°C)
Boiling Range/Point (°C)	74.5°F (23.6°C)
Flash Point (PMCC) (°C)	None (Flash point method and additional flammability data are found in Section 5.)
Explosion Limits (%)	Not flammable
Vapor Pressure	12.8 psia @68°F
Vapor Density (Air = 1)	4.8
Solubility in Water	0.21% @ 70°F (21.1°C) (by weight)
Evaporation Rate	>1 Compared to: Ether = 1
Melting Point (deg C)	-167.8°F (-111°C)
% Volatiles	100

10. STABILITY AND REACTIVITY

Stability

Stable under normal conditions.

Conditions to Avoid

Avoid sources of ignition such as sparks, hot spots, welding flames and lighted cigarettes. At all concentration ranges, exposure of the product to high energy sources may yield toxic and/or corrosive decomposition products.

Incompatibilities:

Strong acids and alkalis, reactive metals e.g. powdered or freshly abraded aluminum (may cause strong exothermic reaction), sodium, potassium, calcium, magnesium, zinc, molten aluminum, barium and lithium shavings. Strong oxidizing agents.

Hazardous Polymerization

Will not occur.



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Hazardous Decomposition Products

- Hydrochloric and hydrofluoric acids
- Carbonyl halides, such as phosgene.

11. TOXICOLOGICAL INFORMATION

Immediate (acute) effects: Acute inhalation:
4 hr LC₅₀ (rat) 26,000 ppm / Cardiac Sensitization Threshold (dog) 5,000 ppm
Anesthetic Concentration 35,000 ppm (10 min.)

Delayed (subchronic and chronic) effects: Subchronic NOEL – 10,000 ppm

Other data: Not a teratogen

12. ECOLOGICAL INFORMATION

Degradability (BOD): Minimal
Octanol Water Partition Coefficient: Not Determined

13. DISPOSAL

RCRA

Is the unused product a RCRA hazardous waste if discarded? Yes
If yes, the RCRA ID number is: U121

Other Disposal Considerations:

Disposal must comply with federal, state, and local disposal or discharge laws. Users should review their operations, then consult with appropriate regulatory agencies before discharging or disposing of waste materials. R-11 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT Hazard Class For individual packages that contain LESS THAN the Reportable Quantity (5000 lbs.), - Not regulated.
For individual packages that contain MORE THAN the Reportable Quantity (5000 lbs.), -RQ, Environmentally Hazardous Substances, Liquid, n.o.s. (Trichlorofluoromethane) 9, PG III, UN3082

US DOT ID Number See Hazard Class

15. REGULATORY INFORMATION

Toxic Substances Control Act (TSCA)

TSCA Inventory Status: Components listed on the TSCA inventory
Other TSCA Issues: None



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SARA Title III / CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>Ingredient Name</u>	<u>SARA / CERCLA RQ (lb.)</u>	<u>SARA EHS TPQ (lb.)</u>
Trichlorofluoromethane	5000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800) 424-8802 and to your Local Emergency Planning Committee.

Section 311 Hazard Class: Immediate
Delayed

SARA 313 Toxic Chemicals

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>Ingredient Name</u>	<u>Comment</u>
Trichlorofluoromethane	None

State Right-to-Know

Other than the ingredients found in Section 2, none are listed.

Additional Regulatory Information

R-11 is subject to the U.S. Environmental Protection Agency Clean Air Act Regulations Sections 610, 611 at 40 CFR Part 82. Section 611 requires the following label text on all shipments of this product:

Warning: DO NOT VENT to the atmosphere. To comply with provisions of the U.S. Clean Air Act, and residual must be recovered. **Contains Trichlorofluoromethane (CFC-11)**, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

WHMIS Classification (Canada)

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all information required by the CPR.

Foreign Inventory Status

EINECS # 2008925

16. OTHER INFORMATION

NFPA Ratings

NFPA Code for Flammability - 0
NFPA Code for Health - 2
NFPA Code for Reactivity - 0

HMIS Ratings

HMIS Code for Flammability - 0
HMIS Code for Health - 1
HMIS Code for Reactivity - 0

The information and recommendations presented in this MSDS are based on sources believed to be accurate; therefore, IONEX Research Corporation assumes no liability for the accuracy or completeness of this information. It is the user's responsibility to determine the suitability of the information for their particular purposes.