Material Safety Data Sheet
Base 4 Oxidizer

MSDS# 91914

Section 1 - Chemical Product and Company Identification

MSDS Name:	Base 4 Oxidizer
Catalog Numbers:	BP3140-2, BP3140-200, BP3140-4, BP3140-450, BP3140N-219, BP3140NB-219, NC9219159, NC9935085
Synonyms:	None.
Company Identification:	Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	201-796-7100
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300

Section 2 - Composition, Information on Ingredients

Risk Phrases: 11 19 36/37

CAS#:	109-99-9
Chemical Name:	Tetrahydrofuran
%:	76-79
EINECS#:	203-726-8
Hazard Symbols:	F XI

Risk Phrases:

CAS#:	110-86-1
Chemical Name:	Pyridine
%:	19.5
EINECS#:	203-809-9
Hazard Symbols:	

Risk Phrases:

CAS#:	128-37-0
Chemical Name:	2,6-Di-tert-butyl-p-cresol
%:	<1.0
EINECS#:	204-881-4
Hazard Symbols:	

Risk Phrases:

CAS#:	7553-56-2
Chemical Name:	Iodine
%:	2.0-2.5
EINECS#:	231-442-4
Hazard Symbols:	

Risk Phrases:

CAS#:	7732-18-5
Chemical Name:	Water
%:	2.0-2.5
EINECS#:	231-791-2

Hazard Symbols:

Text for R-phrases: see Section 16

Hazard Symbols: XN F

Risk Phrases: 11 19 20/21/22 36/37

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! Causes respiratory tract irritation. Causes skin irritation. Hygroscopic (absorbs moisture from the air). May cause central nervous system depression. May be absorbed through intact skin. May cause lung damage. May cause liver and kidney damage. Harmful if swallowed, inhaled, or absorbed through the skin. Uninhibited material, or material from which the inhibitor has been removed or reacted, may form explosive peroxides. Causes severe eye irritation and possible injury. Extremely flammable liquid and vapor. Vapor may cause flash fire. Target Organs: Kidneys, central nervous system, liver, lungs.

Potential Health Effects

Eye:	Contact with eyes may cause severe irritation, and possible eye burns. Vapors may cause eye irritation.
Skin:	Causes skin irritation. May be absorbed through the skin in harmful amounts. If absorbed, causes symptoms similar to those of inhalation.
Ingestion:	Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression.
Inhalation:	Harmful if inhaled. Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Vapors may cause dizziness or suffocation. Inhalation may cause coughing, difficulty breathing and loss of consciousness. Causes irritation of the mucous membrane and upper respiratory tract.
Chronic:	Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. May cause lung damage. Narcotic in high concentrations.

Section 4 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin:	Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion:	Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation:	Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician:	Treat symptomatically and supportively. Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance.

Section 5 - Fire Fighting Measures

Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased

General Information: risk from exposure to this substance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Forms peroxides of unknown stability. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Will be easily ignited by heat, sparks or flame.

Extinguishing Media: Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. In case of fire, use carbon dioxide, dry chemical powder or appropriate foam.

Autoignition Temperature: 321 deg C (609.80 deg F)

Flash Point: -14.4 - -12.2 deg C

Explosion Limits: Lower: 1.8 vol %

Explosion Limits: Upper: 11.8 vol %

NFPA Rating: health: 2; flammability: 3; instability: 1;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to dilute spill to a non-flammable mixture. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Do not ingest or inhale. Prevent build up of vapors to explosive concentration. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool place in the original container and protect from sunlight. Keep under a nitrogen blanket. Keep from contact with oxidizing materials. Flammables-area. Regularly check inhibitor levels to maintain peroxide levels below 1%. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tetrahydrofuran	50 ppm; 100 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	200 ppm TWA; 590 mg/m3 TWA 2000 ppm IDLH (10% LEL)	200 ppm TWA; 590 mg/m3 TWA
Pyridine	1 ppm	5 ppm TWA; 15 mg/m3 TWA 1000 ppm IDLH	5 ppm TWA; 15 mg/m3 TWA
2,6-Di-tert-butyl-p-cresol	2 mg/m3 (inhalable fraction and vapor)	10 mg/m3 TWA	none listed
Iodine	0.01 ppm (inhalable fraction and vapor); 0.1 ppm	2 ppm IDLH	0.1 ppm Ceiling; 1 mg/m3 Ceiling

	STEL (aerosol and vapor)			
Water	none listed	none listed	none listed	

OSHA Vacated PELs: Tetrahydrofuran: 200 ppm TWA; 590 mg/m3 TWA Pyridine: 5 ppm TWA; 15 mg/m3 TWA 2,6-Di-tert-butyl-p-cresol: 10 mg/m3 TWA Iodine: None listed Water: None listed

Engineering Controls:

Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Personal Protective Equipment

Eyes:	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:	Wear appropriate protective gloves to prevent skin exposure.
Clothing:	Wear appropriate protective clothing to prevent skin exposure.
Respirators:	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State:	Physical State:
Color:	colorless
Odor:	ethereal odor - fruity odor
pH:	Not available
Vapor Pressure:	160 mm Hg @25C
Vapor Density:	2.5 (air = 1)
Evaporation Rate:	>1 (Butyl Acetate = 1)
Viscosity:	0.48 cP @ 20C
Boiling Point:	65.4 deg C (149.72°F)
Freezing/Melting Point:	-65 deg C (-85.00°F)
Decomposition Temperature:	Not available
Solubility in water:	Miscible
Specific Gravity/Density:	0.89
Molecular Formula:	C4H8O
Molecular Weight:	72.0554

Section 10 - Stability and Reactivity

Chemical Stability:	Prolonged exposure to air and sunlight may form unstable peroxides. Explosive peroxides may form on concentration. Peroxides can be detonated by friction, impact, or heating. Peroxide formation may occur in containers that have been opened and remain in storage. Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability.
Conditions to Avoid:	Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability., light, moisture, excess heat.
Incompatibilities with Other Materials	Oxidizing agents, acids, bases, oxygen, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), bromine, metal halides, moisture, lithium tetrahydroaluminate, borane, 2-aminophenol + potassium dioxide, calcium hydride + heat, sodium aluminum hydride, sodium tetrahydroaluminate, 2-aminophenol.
Hazardous Decomposition Products	Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization	May occur.

Section 11 - Toxicological Information

RTECS#: CAS# 109-99-9: LU5950000
CAS# 110-86-1: UR8400000
CAS# 128-37-0: GO7875000
CAS# 7553-56-2: NN1575000
CAS# 7732-18-5: ZC0110000

LD50/LC50: RTECS:
CAS# 109-99-9: Inhalation, rat: LC50 = 21000 ppm/3H;
Oral, rat: LD50 = 1650 mg/kg;
.
RTECS:
CAS# 110-86-1: Dermal, guinea pig: LD50 = 1 gm/kg;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = 28500 mg/m3/1H;
Oral, mouse: LD50 = 1500 mg/kg;
Oral, rat: LD50 = 891 mg/kg;
Skin, rabbit: LD50 = 1121 mg/kg;
.
RTECS:
CAS# 128-37-0: Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 500 mg/48H Moderate;
Oral, mouse: LD50 = 650 mg/kg;
Oral, mouse: LD50 = 1040 mg/kg;
Oral, rabbit: LD50 = 2100 mg/kg;
Oral, rat: LD50 = 890 mg/kg;
.
RTECS:
CAS# 7553-56-2: Oral, mouse: LD50 = 22 gm/kg;
Oral, mouse: LD50 = 1000 mg/kg;
Oral, rabbit: LD50 = 10 gm/kg;
Oral, rat: LD50 = 14 gm/kg;
.
RTECS:
CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg;
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Carcinogenicity: Tetrahydrofuran - ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
Pyridine - ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans California: carcinogen, initial date 5/17/02 IARC: Group 3 (not classifiable)
2,6-Di-tert-butyl-p-cresol - IARC: Group 3 (not classifiable)
Iodine - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Water - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 2160 mg/L; 96 Hr; Flow through bioassay (pH 7.5)

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
Hazard Class: 3
UN Number: UN1993
Packing Group: II
Canada TDG
Shipping Name: FLAMMABLE LIQUIDS, N.O.S. (Tetrahydrofuran, Pyridine)
Hazard Class: 3
UN Number: UN1993
Packing Group: II

USA RQ: CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ

USA RQ: CAS# 110-86-1: 1000 lb final RQ; 454 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F

Risk Phrases:

R 11 Highly flammable.

R 19 May form explosive peroxides.

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 109-99-9: 1

CAS# 110-86-1: 2

CAS# 128-37-0: 1

CAS# 7553-56-2: 1

CAS# 7732-18-5: Not available

Canada

CAS# 109-99-9 is listed on Canada's DSL List

CAS# 110-86-1 is listed on Canada's DSL List

CAS# 128-37-0 is listed on Canada's DSL List

CAS# 7553-56-2 is listed on Canada's DSL List

CAS# 7732-18-5 is listed on Canada's DSL List

Canadian WHMIS Classifications: D2B, B2, D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 109-99-9 is listed on Canada's Ingredient Disclosure List

CAS# 110-86-1 is listed on Canada's Ingredient Disclosure List

CAS# 128-37-0 is listed on Canada's Ingredient Disclosure List

CAS# 7553-56-2 is listed on Canada's Ingredient Disclosure List

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

CAS# 109-99-9 is listed on the TSCA Inventory.

CAS# 110-86-1 is listed on the TSCA Inventory.

CAS# 128-37-0 is listed on the TSCA Inventory.

CAS# 7553-56-2 is listed on the TSCA Inventory.

CAS# 7732-18-5 is listed on the TSCA

Inventory.

Section 16 - Other Information

MSDS Creation Date: 7/23/2001

Revision #5 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.
