

MATERIAL SAFETY DATA SHEET**Cap A (Tac₂O) for Fast Deprotection****Section I - Chemical Products & Company Identification**

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For emergency source information (USA) contact: Chemtrec 1-800-424-9300 24 Hours

For emergency source information (International) contact: Chemtrec 001-703-527-3887 (USA) 24 Hours

Trade Names/Synonyms: None Available Chemical Family: Chemical Mixture for DNA/RNA Synthesis

Section 2 - Composition/Information On Ingredients - % by Weight

<u>Chemicals:</u>	<u>Composition (w/w) %:</u>	<u>CAS Number:</u>	<u>Classification:</u>	<u>Odor Threshold:</u>
Tetrahydrofuran	80-100%	109-99-9	F; R: 11-19 Xi; R: 36/37	20-50
t-butylphenoxyacetic acid anhydride	0-10%	Not Available	Not Available	Not Available

Section 3 - Hazards Identification

NFPA (National Fire Protection Association) Ratings (Scale 0-4): **Health: 2** **Flammable: 3** **Reactivity: 1**

Emergency Overview: Irritating to the eyes and respiratory system. The toxicological properties of this material have not been thoroughly investigated as a mixture. Highly flammable (EU). May form explosive peroxides. Use prudent laboratory practices for handling chemical substances. Keep substance away from sources of ignition-No Smoking. Take precautionary measures against static discharges.

Potential Health Effects:

Skin Contact:	Short Term Exposure:	May be an irritant.
	Long Term Exposure:	May cause defatting and dermatitis.
Eye Contact:	Short Term Exposure:	Irritant.
	Long Term Exposure:	May be harmful
Ingestion:	Short Term Exposure:	May be an irritant, may cause narcotic effects, coughing, chest pains, difficulty breathing, nausea, dizziness, headache, and unconsciousness.
	Long Term Exposure:	May be harmful to the liver, kidneys, and central nervous system.
Inhalation:	Short Term Exposure:	Irritant, may cause narcotic effects, coughing, chest pains, difficulty breathing, nausea, dizziness, headache, and unconsciousness.
	Long Term Exposure:	Irritating to the respiratory system.
	Short Term Exposure:	No information available
Injection:	Short Term Exposure:	No information available
	Long Term Exposure:	No information available

CARCINOGEN/REPRODUCTIVE TOXIN STATUS:

	Tetrahydrofuran	t-butylphenoxyacetic acid anhydride
OSHA:	Not Listed	Not Listed
NTP:	Not Listed	Not Listed
IARC:	Not Listed	Not Listed

Section 4: First Aid Measures

- Skin Contact:** Remove contaminated clothing. Flush affected area with water and then wash with soap or mild detergent and water. Observe for signs of irritation. If irritation is present, get medical attention.
- Eye Contact:** Wash eyes with large amounts of water or normal saline for at least 15 minutes. Observe for signs of irritation. If irritation is present, get medical attention.
- Ingestion:** Get medical attention.
- Inhalation:** Remove from exposure area to fresh air immediately. Get medical attention immediately.
- Injection:** If accidentally injected, get medical attention.

Note to Physician: There is no specific antidote. Treat symptomatically and supportively.

Section 5: Fire Fighting Measures

FIRE AND EXPLOSION HAZARD: Flammable liquid (USA). Highly flammable liquid (EU). Unless inhibited, can form unstable and explosive peroxides. Keep away from sources of ignition. **Explosion Limits:** LEL 2% and UEL 11.8%. **Flashpoint:** 1°F or -17°C

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical powder or appropriate foam. Water may be effective for cooling, but may not effect extinguishment.

SPECIFIC HAZARDS: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions. Forms explosive mixtures with air. Emits toxic fumes under fire conditions.

PROTECTION OF FIREFIGHTERS: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Use water spray to cool fire-exposed containers.

Section 6: Accidental Release Measures

OCCUPATIONAL SPILL: Wear appropriate protective clothing and chemically compatible gloves. Place spillage in appropriate container for waste disposal. Wash contaminated clothing before reuse.

US CERCLA REPORTABLE QUANTITY (RQ): 1000 lbs. (RCRA code U213)

Section 7 - Handling and Storage

Observe all federal, state and local regulations. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Keep tightly closed. Store in cool dry place. Use prudent laboratory practices for handling and storage of chemical substances. Avoid prolonged or repeated exposure. Peroxides may accumulate upon prolonged storage in presence of air.

Section 8 - Exposure Controls/Personal Protection

Exposure Controls: Use in laboratory hood or other ventilated device. Wear appropriate respirator where no engineering controls exist.

Eye Protection: Employees must wear splash-proof safety goggles to prevent eye contact with this substance.

Clothing: Employee must wear appropriate protective clothing (laboratory coat with long sleeves) and equipment to prevent skin contact with this material.

Gloves: Employee must wear appropriate protective gloves (Nitrile Gloves, 0.33 mm Thickness) to prevent contact with this material.

Permissible Exposure Limits (USA):

	<u>Tetrahydrofuran</u>	<u>t-butylphenoxyacetic acid anhydride</u>
<u>ACGIH TWA (ppm)</u>	200	N/A
<u>ACGIH STEL/C (ppm)</u>	250	N/A
<u>IDHL (ppm)</u>	2000 [10% LEL]	N/A
<u>OSHA (ppm)</u>	200	N/A
<u>NIOSH (ppm)</u>	200	N/A

Permissible Exposure Limits (Europe):

	Tetrahydrofuran	t-butylphenoxyacetic acid anhydride
Germany (ppm)	200	N/A
USSR-UNEP/IRPTC (MAC)	100 mg/m ³	N/A
U. K. TWA (ppm)	200	N/A
U. K. STEL (ppm)	250	N/A

Section 9 - Physical and Chemical Properties

DESCRIPTION:	Liquid
SOLUBILITY:	Miscible with organic solvents, water causes precipitation of t-butylphenoxyacetic anhydride.
FLASHPOINT:	-14.4°C (THF)/6°F (THF)
MELTING POINT:	Not Applicable
FREEZING POINT:	< -20.0°C
VAPOR DENSITY:	2.5 (THF, air = 1)
VAPOR PRESSURE:	190 mBar at 15°C (THF)
pH:	Slow degradation in water to an acidic solution at approximately pH 2.

Section 10 - Stability and Reactivity

STABILITY:	Stable at room temperature.
REACTIVITY:	Incompatible with bases, slow degradation in water.
CONDITIONS TO AVOID:	Incompatible with bases, strong oxidizers, lithium-aluminum alloys. Exposure to a heat source. Peroxides may accumulate upon prolonged storage in presence of air.
INCOMPATIBILITIES:	Forms explosive mixture with air. Unless inhibited, can form unstable and explosive peroxides. Incompatible with strong acids, strong oxidizers. Attacks some plastics. May accumulate static electric charges that can result in ignition of its vapors.
DECOMPOSITION PRODUCTS:	May include toxic oxides of carbon.
POLYMERIZATION:	Not available

Section 11 - Toxicology Information

TOXICITY:	The toxicological properties of this material have not been investigated as a mixture. <u>Tetrahydrofuran</u> :LD ₅₀ Oral (Rat)=2816 mg/ kg LC ₅₀ Inhalation (Rat)=21000 ppm/ 3 hours
CARCINOGEN STATUS:	No information available
LOCAL EFFECTS:	Irritant.
ACUTE TOXICITY LEVEL:	Irritant.
TARGET EFFECTS:	Eyes, liver (fatty liver degeneration) respiratory system, and central nervous system (CNS)
AT INCREASED RISK FROM EXPOSURE:	Effects on fertility may cause post-implantation mortality.
Active Component:	RTECS Number:
Tetrahydrofuran	LU5950000
t-butylphenoxyacetic acid anhydride	None Available

Section 12 - Ecological Information

ENVIRONMENTAL IMPACT RATING (0-4):	No data available.
ACUTE AQUATIC TOXICITY:	<u>Tetrahydrofuran</u> :

EPA: 8,100 µg/L (no set criteria, permissible ambient goal)

USSR-UNEP/IRPTC (MAC): 0.5 mg/L

DEGRADABILITY:

No data available.

LOG BIOCONCENTRATION FACTOR (BCF):

No data available.

Section 13 - Disposal Information

Observed all Federal, State, and Local Regulations.

Section 14 - Transportation Information

Ship as regulated material. Transportation restrictions apply. The acute toxicity profile does warrant shipment as a hazardous material (DOT) or a dangerous good (IATA).

UN2056**Hazard Class: 3****Packing Group II****Label Requirement: Flammable liquid, Tetrahydrofuran.****Section 15 - Regulatory Information**

	<u>Tetrahydrofuran</u>	<u>t-butylphenoxyacetic acid anhydride</u>
Europe:		
EINECS/ELINCS:	203-726-8	No
EC INDEX NO.	306-025-00-0	No
Canada:		
DSL/NDSL:	DSL	No
United States:		
TSCA STATUS:	Yes, 4/12b, Notices of Export	No
CERCLA SECTION 103 (40 CFR 302.4):	1000 lbs.	No
SARA SECTION 302 (40 CFR 355.30):	No	No
SARA SECTION 304 (40 CFR 355.40):	No	No
SARA SECTION 313 (40 CFR 372.65):	No	No
OSHA PROCESS SAFETY (29 CFR 1910.119):	No	No
CALIFORNIA PROPOSITION 65	No	No
SARA ACUTE HAZARD (40 CFR 370.21):	Yes	No
CHRONIC HAZARD:	Yes	No
FIRE HAZARD:	Yes	No
REACTIVITY HAZARD:	No	No
SUDDEN RELEASE HAZARD:	No	No

Classification:

F; R 11-19 Xi: R 36/37

Symbols: F (Flammable) and Xi (Irritant)

Safety Phrases: Mixture**S:16****Keep away from sources of ignition- No Smoking.****S:33****Take precautionary measures against static discharges.****For Laboratory R&D Use Only.****Section 16 - Other**

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