Trigonox 161

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME
Trigonox 161

CHEMICAL NAME
1,1-Di-(tert-butylperoxy)cyclohexane with tert-butyl peroxy-2-ethylhexanoate

SYNONYM
None available

CHEMICAL FORMULA
Mixture

CAS #
MIXTURE

CHEMICAL FAMILY
Organic peroxides

MANUFACTURERS NAME
Akzo Nobel Chemicals Inc.

PRODUCT/TECHNICAL INFORMATION
1-800-828-7929

ADDRESS
300 South Riverside Plaza
Chicago, IL 60606

MEDICAL/HANDLING EMERGENCY
1-914-693-6946

COUNTRY
USA

TRANSPORTATION EMERGENCY
CHEMTREC 1-800-424-9300

PRODUCT USE
Polymer initiator

REVISION DATE
6/09/1998

ISSUE DATE
6/15/1994

REVISION NO.
005

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE DESCRIPTION	PERCENT	CAS#
1,1-Di-(tert-butylperoxy)cyclohexane	40.000	3006-86-8
Butyl benzyl phthalate	10.000	85-68-7
tert-Butyl peroxy-2-ethylhexanoate	25.000	3006-82-4
Dioctyl phthalate	25.000	117-81-7

SECTION 3. HAZARDS IDENTIFICATION

Appearance & Odor
Clear colorless liquid with a distinct odor.

STATEMENT OF HAZARDS
DANGER!
ORGANIC PEROXIDE.
REFRIGERATED ORGANIC PEROXIDE - MAINTAIN COOLING.
HEAT OR CONTAMINATION MAY CAUSE HAZARDOUS DECOMPOSITION.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.
COMBUSTIBLE LIQUID AND VAPOR.
POSSIBLE CANCER HAZARD. CONTAINS DIOCTYL PHTHALATE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.

Fire & Explosion Hazards
This product is a combustible liquid. Peroxides and decomposition products are flammable and can ignite with explosive force if confined.

Primary Route of Exposure
Skin or eye contact and inhalation of vapor or mists are the principal routes of exposure to this product.

SECTION 3. HAZARDS IDENTIFICATION (CONTINUED)

Inhalation Acute Exposure
Inhalation of vapor, mists and/or aerosol may cause irritation of the nose, throat, lungs and eyes.

Skin Contact - ACUTE
Skin contact may cause irritation.

Eye contact - ACUTE
Eye contact may cause irritation.

Ingestion - ACUTE
Irritation to the mouth, throat, esophagus and stomach may be caused by ingestion of this material. Ingestion may result in nausea and/or vomiting.

CARCINOGENICITY

IARC	....YES	OSHA	....NO
NTP	....YES	ACGIH	....NO

SECTION 4. FIRST AID MEASURES

Inhalation First Aid
Remove to fresh air. If breathing becomes difficult, oxygen may be given, preferably with a physician's advice. If not breathing, give artificial respiration. Get medical attention.

Skin Contact - First Aid
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention if indicated. Wash clothing before reuse.

Eye Contact - First Aid
Immediately flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Take care not to contaminate the victim's healthy skin and eyes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids. DO NOT let victim rub eye(s). Do not attempt to neutralize with chemical agents. Get medical attention immediately. Oils or ointments should not be used at this time. Continue flushing for an additional 15 minutes if a physician is not immediately available.

Ingestion - First Aid
DO NOT induce vomiting. Call a physician or a poison control center immediately. Give victim plenty of water to drink. Never give anything by mouth to an unconscious or convulsing person. Get medical attention immediately.

Medical conditions aggravated
There are no data available that address medical conditions that are generally recognized as being aggravated by exposure to this product.

Note to Physician
No specific antidote is known. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical conditions.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT
147.20 F 64.00 C

FLASH METHOD
Setaflash Closed Cupp

AUTO IGNITION TEMPERATURE
N/D F N/D C

UPPER EXPLOSION LIMIT
N/D

LOWER EXPLOSION LIMIT
N/D

Extinquishing Media
Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.

Fire Fighting Procedures
As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. If possible, move containers from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard.

Contaminated buildings, areas and equipment must not be used until they are properly decontaminated. Dike fire water for later disposal. Do not allow contaminated water to enter waterways.

Fire & Explosion Hazards
This product is a combustible liquid. Peroxides and decomposition products are flammable and can ignite with explosive force if confined.

Other Fire + Explosion Hazards
This product can produce vapors which may travel to a source of ignition and flash back.

Hazardous Products/Combustion
Thermal decomposition produces oxides of carbon and/or hazardous fumes, vapors and/or gasses.

NFPA HEALTH RATING
2

NFPA FLAMMABILITY RATING
2

NFPA REACTIVITY RATING
2

NFPA OTHER

SECTION 6. ACCIDENTAL RELEASE MEASURES

Cleanup
Stop source of spill. Dike area to prevent spill from spreading. Ventilate enclosed areas to prevent formation of toxic or oxygen deficient atmosphere. A water fog, fine spray or blanket of fire-fighting foam can be used to reduce vapors.

Evacuate all non-essential personnel upwind. Any person entering an area of a significant spill or of an unknown concentration of a gas or a vapor should use a NIOSH-approved, positive-pressure/pressure-demand, self-contained breathing apparatus. Protective equipment to prevent skin and eye contact should be worn.

Soak up liquid with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal. CAUTION! The spill area may be slippery.

SECTION 6. ACCIDENTAL RELEASE MEASURES (CONTINUED)

Contaminated areas, buildings and equipment must not be used until they have been properly decontaminated. Generously cover contaminated area with a slurry of common household, powdered laundry detergent and water. Using a stiff brush, work the slurry into cracks & crevices. Allow to stand for 2-3 minutes. Then flush with water. Repeat if necessary. Dike water for later disposal. Do not allow contaminated water to enter waterways.

SECTION 7. HANDLING AND STORAGE

Handling

Containers should be located in an area where they can be rotated regularly (first in, first out) and visually inspected for damage or bulging on a regular basis.

Use approved equipment for transport of containers to avoid puncturing or rupturing containers. Do not use air pressure to empty containers.

Protective equipment should be worn when handling this product to avoid eye and skin contact.

Emptied container may retain product residues. Follow all warnings and precautions even after container is emptied.

Storage

To insure product quality, storage temperatures should not exceed 68 F (20 C).
To insure against possible exothermic self-accelerating decomposition, storage temperatures must not exceed 95 F (35 C). This emergency temperature is derived from the SADT (see Sect.9).
Keep containers tightly closed. Store away from reducing agents (e.g. amines, acids, alkalis) and heavy metal compounds (e.g. driers metal soaps and accelerators).

MAXIMUM STORAGE TEMPERATURE

68.00 F 20.00 C

General Comments

Containers should not be opened until ready for use. Use clean non-sparking equipment and tools when handling.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection

Use a NIOSH-approved organic vapor respirator with dust, mist and fume filters to reduce potential for inhalation exposure if use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well-ventilated area) is not available. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/pressure-demand, air-supplied respirator.

When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the workshift) to assure breakthrough exposure does not occur.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

Skin Protection
Skin contact with this product should be prevented through the use of suitable protective clothing, gloves, and footwear selected with regard for use condition exposure potential.

Eye Protection
If the possibility of splashing or spraying of this material exists, chemical goggles and/or a full face shield should be worn.

Ventilation protection
Sufficient good general ventilation should be provided to keep concentration below the exposure limit. All work with laboratory samples should be conducted in a hood.

Other Protection
Safety showers, with quick opening valves which stay open, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

APPLICABLE EXPOSURE LIMITS
Other than any exposure limits which may be displayed in Section 8, there are no other known exposure limits applicable to this product or its components.

EXPOSURE LIMITS/REGULATORY INFORMATION (IN MG/M3)

SUBSTANCE DESCRIPTION	REG. AGCY	PEL	TLV	TWA	STEL	CEIL
1,1-Di-(tert-butylperoxy)cyclohexane						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
Butyl benzyl phthalate						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
tert-Butyl peroxy-2-ethylhexanoate						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
Dioctyl phthalate						
	OSHA	5.0000	N/D	N/D	10.0000	N/D
	ACGIH	N/D	5.0000	N/D	10.0000	N/D
	NIOSH	N/D	N/D	5.0000	10.0000	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D

LEGEND:

EXPOSURE LIMIT DESCRIPTIONS
CEIL Ceiling Exposure Limit
PEL Permissible Exposure Limit

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

STEL Short Term Exposure Limit
TLV Threshold Limit Value
TWA Time Weighted Average
N/D = Not Determined

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE (mm Hg)
N/D

VAPOR DENSITY (Air = 1.0)
GT 1

EVAPORATION RATE
N/D

VOLATILE %
N/D

BOILING POINT
N/D F N/D C

ODOR THRESHOLD (ppm)
N/D

SPECIFIC GRAVITY
EQ .893 @ 25 deg C

BULK DENSITY
N/D

SOLUBILITY IN WATER
N/D Negligible

SOLUBILITY IN OTHER SOLVENTS

COEFFICIENT OF OIL/WATER
N/D

POUR POINT
N/D F N/D C

MELTING POINT
N/D F N/D C

pH FACTOR
N/D

CLOUD POINT
N/D F N/D C

FLASH POINT
147.20 F 64.00 C

FLASH METHOD
Setaflash Closed Cupp

UPPER EXPLOSION LIMIT
N/D

LOWER EXPLOSION LIMIT
N/D

AUTO IGNITION TEMPERATURE
N/D F N/D C

Other
SADT=104 F (40 C) (see Sect.10).

SECTION 10. STABILITY AND REACTIVITY

Stability
This product is stable at ambient temperatures but may decompose if exposed to temperatures above 95 F (35 C).

Incompatibilities
This material is incompatible with strong acids, strong alkalis, strong oxidizing agents, reducing agents and accelerators.

Polymerization
Hazardous polymerization will not occur.

Decomposition
Burning may produce carbon dioxide and/or carbon monoxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

SECTION 10. STABILITY AND REACTIVITY (CONTINUED)

Conditions to Avoid

The SADT for this product is 104 F (40 C).
The SADT (self-accelerating decomposition temperature) is an experimentally derived temperature at which a typical package of the product will undergo self-accelerating decomposition. Decomposition can be expected to be hazardous and uncontrollable.
Under no circumstances should this product be exposed to temperatures near or above the emergency temperature of 95 F (35 C). Such an exposure could initiate hazardous decomposition.
Contact with incompatible materials such as acids, alkalis, heavy metals and reducing agents will also result in hazardous decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicological - Inhalation

Inhalation toxicity is not available for this product.

Inhalation Chronic Exposure

Prolonged or repeated inhalation of vapors, mists and/or aerosol may cause irritation of the nose, throat, lungs and eyes and may pose risk of pulmonary diease such as chronic lung inflammation with shortness of breath and cough.

Toxicological - Dermal

Dermal toxicity data is not available for this product.

Skin Contact - CHRONIC

Prolonged or repeated skin contact may result in irritation with redness.

Toxicological - Eye

Toxicity data is not available for this product.

Toxicological - Ingestion

Ingestion toxicity data is not available for this product.

Ingestion - CHRONIC

Health effects as a result of chronic ingestion are not known.

CARCINOGENICITY/MUTAGENICITY

The carcinogenic/mutagenic properties of this product are not known.

REPRODUCTIVE EFFECTS

The reproductive toxicity of this product is not known.

NEUROTOXICITY

The neurotoxic effects of this product are not known.

Other Toxicological Effects

Long term feeding of DIOCTYL PHTHALATE to rats and mice produced tumors (cancer) in both sexes and caused NTP to list DOP (or DEHP) as a possible carcinogen. IARC also found the study and conclusions valid. Some other toxicologists question the results due to faulty experimental design, including excessive weight loss, feeding quantities greater than the maximum tolerated dose and the fact that humans metabolize the substance differently from rats.

SECTION 11. TOXICOLOGICAL INFORMATION (CONTINUED)

Target Organs
Overexposure to this product may affect the skin, eyes and respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
The ecological toxicity of this product is not known.

DISTRIBUTION
Other ecological information on this product is not known.

CHEMICAL FATE
Chemical fate information on this product is not known.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal
The characteristics of Ignitability (D001) and Reactivity (D003) as per RCRA, would be exhibited by unused product if it becomes a waste material.
It is the responsibility of the waste generator to evaluate whether his wastes are hazardous by characteristic or listing. All waste should be disposed of in accord with federal, state and local regulations. Note: State and/or local regulations may be more stringent than federal regulations.

CONTAINER DISPOSAL
Containers should be cleaned of residual product before disposal.
Empty containers should be disposed of in accordance with all applicable laws and regulations.

SECTION 14. TRANSPORT INFORMATION

SHIPPING DESCRIPTION
ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED
(TERT-BUTYL PEROXY-2-ETHYLHEXANOATE, 25%
1,1-DI-(TERT-BUTYLPEROXY) CYCLOHEXANE, 40%)
5.2, UN3113, PG II
NORTH AMERICAN ERG NO: 148
CONTROL TEMPERATURE: 30 C (86 F)
EMERGENCY TEMPERATURE: 35 C (95 F)

REQUIRED LABELS
ORGANIC PEROXIDE.

ENVIRON. HAZARDOUS SUBSTANCE
This product contains butyl benzyl phthalate (RQ=100 lbs.) which is an enviromentally hazardous material per 49 CFR 172.101, Appendix A.

SECTION 15. REGULATORY INFORMATION

SECTION 15. REGULATORY INFORMATION (CONTINUED)

Component 1,1-Di-(tert-butylperoxy)cyclohexane is subject to the following

Enviromental List

DSL	Domestic Substance List-Canada
NJ R-T-K	New Jersey R-T-K Hazard. Sub.
TSCA	Toxic Subst. Cont. Act -listed

Component Butyl benzyl phthalate is subject to the following

Enviromental List

CERCLA	CERCLA Hazardous Substances
DSL	Domestic Substance List-Canada
MA. LIST	Massachusetts Substance List
NJ R-T-K	New Jersey R-T-K Hazard. Sub.
PA. LIST	Penn. Hazardous Substance List
SARA 302	SARA Title III, Section 302
SARA 313	SARA Title III, Section 313
TSCA	Toxic Subst. Cont. Act -listed

Component tert-Butyl peroxy-2-ethylhexanoate is subject to the following

Enviromental List

DSL	Domestic Substance List-Canada
NJ R-T-K	New Jersey R-T-K Hazard. Sub.
TSCA	Toxic Subst. Cont. Act -listed

Component Dioctyl phthalate is subject to the following

Enviromental List

CAA 112	Clean Air Act Sect. 112
CERCLA	CERCLA Hazardous Substances
DSL	Domestic Substance List-Canada
IARC	IARC Carcinogens-Grps. 1,2A,2B
MA. LIST	Massachusetts Substance List
NJ R-T-K	New Jersey R-T-K Hazard. Sub.
PA. LIST	Penn. Hazardous Substance List
PROP 65	California Proposition 65
SARA 302	SARA Title III, Section 302
SARA 313	SARA Title III, Section 313
TSCA	Toxic Subst. Cont. Act -listed

OTHER REGULATORY INFORMATION

Warning! This product contains a chemical known to the State of California to cause cancer.

SECTION 15. REGULATORY INFORMATION (CONTINUED)

WHMIS HAZARD CLASS
B-3,C,D-2B,F

HAZARD RATING SOURCE
HMIS

HEALTH
2*

REACTIVITY
2

FLAMMABILITY
2

OTHER

SECTION 16. OTHER INFORMATION

OTHER INFORMATION
TRIGONOX is a registered trademark of Akzo Nobel Chemicals Inc.

CREATED BY
Product Safety 914-674-5000

KEY TO ABBREVIATIONS:

EQ=EQual	LT=Less Than	GT=Greater Than
AP=APproximately	TR=TRace	ND=No Data available