



Cell Signaling

TECHNOLOGY®

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200

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Version: 1

SECTION 1. Identification

Product identifier

Product No. 13354
Product name TBHP
UN number UN3109
Other means of identification 13354S

Recommended use of the chemical and restrictions on use

Identified uses This product is intended for research purposes only.
Uses advised against This product is not intended for use in diagnostic procedures or therapeutics.
This product is not intended for use in humans or animals.

Manufacturer, importer, supplier

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SECTION 2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Vapors)	Category 3
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Flammable liquids	Category 3
Organic peroxides	Type F

GHS Label elements, including precautionary statements

**Signal Word**

Danger

Hazard statement(s)

Harmful if swallowed
 Toxic in contact with skin
 Toxic if inhaled
 Causes severe skin burns and eye damage
 Suspected of causing genetic defects
 May cause an allergic skin reaction
 Heating may cause a fire
 Flammable liquid and vapor

Precautionary Statement(s)

Keep away from heat/sparks/open flames/hot surfaces. — No smoking
 Keep/store away from clothing/combustible materials
 Wear protective gloves/protective clothing/eye protection/face protection
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 Immediately call a POISON CENTER or doctor/physician
 Protect from sunlight
 Store at temperatures not exceeding 8 °C/ 46.4 °F. Keep cool

Supplementary Hazard Information

Hazards not otherwise classified (HNOC) Toxic to aquatic life with long lasting effects.

SECTION 3. Composition/information on ingredients

Formula C₄H₁₀O₂
Molecular Weight 90.12
Synonyms TBHP-70; Tertiary butyl hydroperoxide; Hydroperoxide, 1,1-dimethylethyl

Chemical Name	CAS No.	Weight %
tert-Butyl hydroperoxide	75-91-2	60-100

SECTION 4. First-aid measures

Eye contact Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing.

Skin contact Immediate medical attention is required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Wash off immediately with soap and plenty of water.

Inhalation Move to fresh air. Immediate medical attention is required. Move to fresh air in case of accidental inhalation of vapors. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion Do NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Remove from exposure, lie down this is a test. Clean mouth with water. If swallowed, do not induce vomiting - seek medical advice. Rinse mouth.

Most important symptoms and effects, both acute and delayed

Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Advice for emergency responders

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
Protection of First-aiders Use personal protective equipment. Avoid contact with skin, eyes and clothing.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable Extinguishing Media Cool containers / tanks with water spray.
Unsuitable Extinguishing Media CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes.

Explosion Data

Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Use personal protective equipment. Evacuate personnel to safe areas. Avoid contact with skin, eyes and clothing. Remove all sources of ignition. Heat, flames and sparks. Ensure adequate ventilation. Keep people away from and upwind of spill/leak.
Other information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Do not allow material to contaminate ground water system. Should not be released into the environment. Prevention of fire and explosion. A vapor suppressing foam may be used to reduce vapors. Try to prevent the material from entering drains or water courses. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.
Methods for cleaning up	Dike far ahead of liquid spill for later disposal. Soak up with inert absorbent material. Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly. Prevent product from entering drains. Dam up. After cleaning, flush away traces with water.

SECTION 7. Handling and storage**Precautions for safe handling**

Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only in an area containing flame proof equipment. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Avoid contact with skin and eyes. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. There is a hazard associated with rags, paper or any other material used to remove spills which become soaked with product. Avoid accumulation of these: they are to be disposed off safely after use. Avoid static electricity build up with connection to earth.

Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions	Keep containers tightly closed in a dry, cool and well-ventilated place.
Packaging material	No information available.
Incompatible products	The product is a strong oxidant and reacts violently with: metallic or sulphur compounds, combustible, reducing and organic materials.

SECTION 8. Exposure controls/personal protection**Control parameters**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Appropriate engineering controls

Showers, eyewash stations, and ventilation systems.

Individual protection measures, such as personal protective equipment

Personal protective equipment (PPE) needs to be selected depending on the implemented engineering controls, frequency/duration of work activities and the concentrations of the hazardous substance.

Eye/face protection	Tightly fitting safety goggles. Face-shield.
Skin and body protection	Wear protective gloves/clothing.
Respiratory protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
Hygiene measures	When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Keep away from food, drink and animal feeding stuffs. Contaminated work clothing should not be allowed out of the workplace. Avoid contact with skin, eyes and clothing. For environmental protection, remove and wash all contaminated protective equipment before re-use. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use.

SECTION 9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Odor	Pungent
Color	Clear, light yellow
Odor Threshold	No information available
pH	4.3 @ 20 °C
Melting point/freezing point	-3 °C @ 1013 hPa
Initial boiling point and boiling range	96.2 °C @ 1013 hPa
Flash point	42 °C Closed cup
Evaporation rate	No information available
Flammability (solid, gas)	No information available
Upper flammability limit	10.15% No information available
Lower flammability limit	5.75% No information available
Vapor pressure	30.73 hPa @ 20 °C
Vapor density	No information available
Relative density	No information available
Solubility	Soluble in water @ 20 °C
Solubility in other solvents	No information available
Partition coefficient: n-octanol/water	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Molecular Weight	90.12
VOC content	No information available
Viscosity	No information available
Density	No information available

SECTION 10. Stability and reactivity

Reactivity

No information available.

Chemical stability

Stable under recommended storage conditions. Heating may cause an explosion.

Possibility of hazardous reactions

Hazardous reactions	Risk of explosion if heated under confinement.
Hazardous polymerization	None under normal processing.

Conditions to Avoid

Heat, flames and sparks. Exposure to air or moisture over prolonged periods.

Incompatible Materials

The product is a strong oxidant and reacts violently with: metallic or sulphur compounds, combustible, reducing and organic materials.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 11. Toxicological information

Information on likely routes of exposure

Inhalation	Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate.
Eye contact	Corrosive to the eyes and may cause severe damage including blindness.
Skin contact	Corrosive to skin.
Ingestion	Ingestion causes burns of the upper digestive and respiratory tract.

Information on toxicological effects

This material should only be handled by, or under the close supervision of, those properly qualified in the handling and use of potentially hazardous chemicals. It should be borne in mind that the toxicological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
tert-Butyl hydroperoxide	= 370 mg/kg (Rat)	= 790 mg/kg (Rat) = 460 mg/kg (Rabbit)	= 500 ppm (Rat) 4 h = 1.85 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Symptoms	Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing.
Skin corrosion/irritation	Causes severe burns.
Serious eye damage/eye irritation	Risk of serious damage to eyes.
Corrosivity	This product is corrosive to living tissue.
Sensitization	May cause sensitization of susceptible persons.
Mutagenic effects	Mutagenic in vitro in the bacterial reverse mutation assays (AMES test).
Carcinogenicity	No component of this product present at levels greater than or equal to 0.1% is identifiable as probable, possible or confirmed carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Neurological effects	No information available.
Aspiration Hazard	No information available.

SECTION 12. Ecological information

Ecotoxicity

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
tert-Butyl hydroperoxide	ErC50 1.5 mg/l (Selenastrum capricornutum) 72 h EbC50 0.84 mg/l (Selenastrum capricornutum) 72 h	LC50 22 mg/l (Pimephales promelas) 96 h	EC50 14 mg/l (Daphnia magna) 48 h

Persistence and degradability	Not readily biodegradable.
Bioaccumulation	Material may have some potential to bioaccumulate but will likely degrade in most environments before accumulation can occur.
Mobility	Is predicted to have low mobility in the environment

Chemical Name	Octanol-Water Partition Coefficient

tert-Butyl hydroperoxide	0.7
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Other adverse effects

No information available.

SECTION 13. Disposal considerations

Waste Disposal Methods

Should not be released into the environment.

Disposal considerations

Do not empty into drains; dispose of this material and its container in a safe way.

SECTION 14. Transport information

DOT

UN number	UN3109
UN proper shipping name	Organic peroxide type F, liquid (tert-Butyl hydroperoxide)
Transport hazard class(es)	5.2 (8)
Packing Group	II
Special precautions for user	IP5
Emergency Response Guide Number	145

IATA

UN number	UN3109
UN proper shipping name	Organic peroxide type F, liquid (tert-Butyl hydroperoxide)
Transport hazard class(es)	5.2 (8)
Packing Group	II
Special precautions for user	A20, A150, A802

IMDG/IMO

UN number	UN3109
UN proper shipping name	Organic peroxide type F, liquid (tert-Butyl hydroperoxide)
Transport hazard class(es)	5.2 (8)
Packing group	II
EmS No.	F-J, S-R
Special precautions for user	122, 274

SECTION 15. Regulatory information

North American Inventory Listing

Component	TSCA	DSL	NDSL
tert-Butyl hydroperoxide 75-91-2 (60-100)	Listed	Listed	Not Listed

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
tert-Butyl hydroperoxide 75-91-2	Listed	Listed	Listed

U.S. EPA Label Information

This product does not contain any substances regulated as pesticides.

SECTION 16. Other information

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Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet