

GPS Safety Summary

Substance Name:

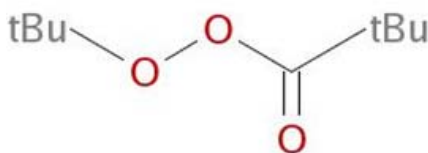
tert-butyl peroxyvalate

1. General Statement

The substance is primarily used as a radical initiator. The substance is used at the industrial stage and is not sold to general population.

2. Chemical Identity

Name:	tert-butyl peroxyvalate
Brand names:	Luperox® 11NO30, Luperox® 11PAR30, Luperox® 11 PARE30, Luperox® 11M grades
Chemical name (IUPAC):	tert-butyl 2,2-dimethylpropaneperoxoate
CAS number(s):	927-07-1
EC number:	213-147-2
Molecular formula:	C ₉ H ₁₈ O ₃
Structure:	



3. Use and applications

The substance is primarily used as a radical initiator to induce polymerisation (free radical polymerisation process) for the manufacture of e.g. polypropylene. The substance is used at the industrial stage and is not sold to general population.

4. Physical / Chemical properties

Organic peroxides are thermally unstable substances or mixtures, which can undergo exothermic self-accelerating decomposition.

Property	Value
Physical state	Liquid at 20 °C and 1013 hPa
Colour	Colourless
Odour	Strong, ester-like
Molecular weight	174.24 g/mol
Density	0.85 g/cm ³ at 20°C (75% in isododecane)
Vapour pressure	1.27 mbar at 20°C

Freezing point	<-20°C
Boiling point	Not relevant, the substance decomposes before boiling
Self-Accelerating Decomposition Temperature (SADT)	25°C
Explosive properties	Risk of explosion if heated under confinement
Water solubility	1.49 g/L at 20°C
Octanol-water partition coefficient (LogKow)	3.17 at 25°C

5. Health Effects

Due to its irritating and sensitising properties, the substance has to be handled with caution.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	No acute toxic effects following oral / dermal exposure. Following acute inhalation exposure, irritation of respiratory tract may occur.
Irritation / corrosion Skin / eye	Causes skin irritation.
Sensitisation	May cause skin allergic reaction.
Toxicity after repeated exposure Oral / inhalation / dermal	Does not cause significant target toxicity following oral exposure.
Genotoxicity / Mutagenicity	Based on the overall <i>in vitro</i> and <i>in vivo</i> data, the substance is considered without any genotoxic potential.
Carcinogenicity	No data available.
Reproductive / Developmental Toxicity	Does not cause adverse effects on reproduction in absence of maternal toxicity.

6. Environmental Effects

The ready biodegradability test performed with this substance has shown that tert-butyl peroxy-pivalate is not readily biodegradable, but can be considered as inherently biodegradable. Due to its moderate toxicity and its lack of bioaccumulation, the substance is not a PBT or vP/vB substance.

Effect Assessment	Result
Aquatic Toxicity	Toxic to daphnids and algae, harmful to fish

Fate and behaviour	Result
Biodegradation	Not readily biodegradable
Bioaccumulation potential	No potential to bioaccumulate
PBT / vPvB conclusion	Not considered as PBT nor vPvB

7. Exposure

7.1 Human health

The manufacture of organic peroxide is a closed process that occurs behind anti-deflagration walls, which minimizes worker exposure during the production process.

However, workers can be exposed during loading/unloading operations, mixing, sampling or maintenance operations.

The primary routes of industrial/professional exposure of the substance are skin contact and inhalation.

In addition, the general population is not expected to be exposed to this organic peroxide by inhalation, dermal or oral exposure, as the product does not remain in the plastic products.

Based on the risk assessment, risk is controlled when activities are carried out under conditions recommended in the extended safety data sheet (chapter 8 and exposure scenarios)

7.2 Environment

Releases of organic peroxides into the environment are to be expected during production, processing (formulation) and industrial uses mainly via wastewater and lesser amounts via emissions of vapour (due to its physical state and its vapour pressure).

Potential release during production is treated by on-site and off-site risk management measures.

The substance is used for production of polymers, which can either be dry or wet processes. In case of wet processes, releases to water have to be directed to wastewater treatment plant.

The substance is used in small quantities in polymer production, and is almost totally consumed during the process. Therefore the release to environment is very low. As the substance shows no potential for bioaccumulation and can be degraded, the use is considered as safe for the environment (this was confirmed by a quantitative risk assessment performed in the framework of REACH regulation)

8. Risk Management recommendations

Human health measures	
Eye/Face protection	Safety glasses/goggles Half-mask during the discharge
Skin protection	Protective suit
Hand protection	Gloves: PVC, neoprene (suitable gloves tested to EN374)
Respiratory protection	Suitable respiratory equipment in case of insufficient ventilation
Organizational measures	Ensure workers are duly trained to minimize exposure
Engineering control	Provide sufficient air exchange and/or exhaust ventilation in work rooms

Environmental measures
<p>Can be discharged in waste water, when in compliance with local regulations. Do not spread sludge on natural soils.</p> <p>Eliminate the product by incineration after dilution in a suitable flammable solvent (in accordance with local and national regulations) – amount of active oxygen must be below 1%.</p>
Storage and handling
<p>Strictly limit the quantities of product in the work area to those which are absolutely necessary for the work in hand. Great cleanliness in work areas is a necessary and important factor for safety. Never weigh out in the storage room. Handle and open container with care (risk of overpressurization in containers). Eliminate all sources of ignition, and do not generate flames or sparks. Take precautionary measures against static discharges. Apply earthing when transferring from one container to another. Confinement must be avoided. Use explosion protected equipment.</p> <p>Use non-sparking tools in areas where explosive vapor/air mixtures may occur. Keep product and emptied container away from heat and sources of ignition. Do not cut or weld on or near this container even when empty. Keep away from incompatible materials such as: strong oxidizing agents, powerful reducers, acids, bases, amines, transition metal salts, sulphur compounds, rust, ash, dusts (risk of self-accelerating exothermic decomposition)</p> <p>Never return any product to the container from which it was originally removed (risk of decomposition).</p> <p>For the most concentrated product (75%): avoid temperatures above -5 °C (prevention of fire and explosion). Storage buildings must be built and equipped so as not to exceed the maximum proscribed temperature limit.</p>

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has been registered under:

- EU Regulation EC 1907/2006 (REACH)




As organic peroxides are sensitive substances (as they are liable to exothermic decomposition), the carriage of tert-butyl peroxyvalate is strongly regulated, under the rules and conditions of class 5.2 of UN Recommendations on the Transport of Dangerous Goods regulation.

%	Form	UN Number	Classification	OP Category
>67-77%	liquid	UN 3113	OP Type C, Liquid, temperature controlled	Type C: the mixture possesses explosive properties but cannot detonate or deflagrate rapidly or undergo a thermal explosion when packaged
>27-67%	liquid	UN 3115	OP Type D, Liquid, temperature controlled	Type D: (i) detonates partially, does not deflagrate rapidly, no violent effects when heated under confinement; or (ii) does not detonate at all, deflagrates slowly, no violent effects when heated under confinement; or (iii) does not detonate or deflagrate, medium effect when heated under confinement

≤27%	liquid	UN 3119	OP Type F, Liquid, temperature controlled	Type F: neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power
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9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification	
According to REGULATION (EC) no 1272/2008: <ul style="list-style-type: none"> – Organic peroxide; type C; Heating may cause a fire. – Skin irritation; Category 2; Causes skin irritation. – Skin sensitisation; Category 1; May cause an allergic skin reaction – Specific Target Organ Toxicity – single exposure; Category 3; May cause respiratory irritation. – Chronic aquatic toxicity; Category 2; Toxic to aquatic life with long lasting effects. 	
Signal word	
– Danger	
Pictogram	
– GHS02: Flame	
– GHS07: Exclamation mark	
– GHS09: Environment	
Hazard statement	
<ul style="list-style-type: none"> – H242: Heating may cause a fire. – H315: Causes skin irritation. – H317: May cause an allergic skin reaction. – H335: May cause respiratory irritation. – H411: Toxic to aquatic life with long lasting effects. 	
Additional classification according to Globally Harmonized System (GHS)	
<ul style="list-style-type: none"> – H303 : May be harmful if swallowed – H313 : May be harmful in contact with skin – H333 : May be harmful if inhaled – H401: Toxic to aquatic life 	

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- arkema.peroxides-reach-uses@arkema.com
- ICCA portal where the GPS Safety Summary is posted:
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

11. Date of Issues / Revision

- Date of issue: 2014/07/10
- Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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