

NOROX[®] TBPB

DESCRIPTION

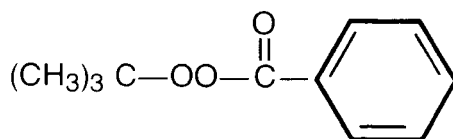
Norox[®] TBPB is a liquid, high purity form of tertiary-Butyl Perbenzoate. This product is used extensively as an initiator in free radical polymerization reactions. Norox[®] TBPB offers the following advantages:

- Low water content
- Low hydroperoxide content
- Exceptional purity
- Low room temperature reactivity

TYPICAL PROPERTIES

| | |
|----------------------------------|--|
| t-Butyl Peroxybenzoate | 98.0 % |
| Active Oxygen | 8.1 %, min. |
| Form | Liquid |
| Color | Light yellow to straw |
| Specific Gravity @ 25°/4°C | 1.04 |
| Melting Point | 48°F / 9°C |
| Flash Point (C.O.C.) | 200°F / 93°C, min. |
| Soluble in | Alcohols, esters, ethers, ketones, hydrocarbons & chlorinated hydrocarbons |
| Partially soluble in | Glycols |
| Insoluble in | Water |

CHEMICAL STRUCTURE



Molecular Weight — 194
Empirical Formula — C₁₁H₁₄O₃

THERMAL DECOMPOSITION DATA (Half-life in benzene):

| | | | | | | | | |
|------------------|-----|-----|----|-----|-----|-----|-----|-----|
| Temperature (°C) | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 |
| Hours | 600 | 190 | 59 | 18 | 6 | 2 | 0.5 | 0.2 |

Half-life data is generated by using 0.2 moles/liter of the specific peroxide dissolved in a solvent, generally benzene. The half-life of this highly diluted peroxide is the time required for decomposition of one-half of the peroxide. The rate of decomposition is directly related to the rate of generation of free radicals, and this half-life data can provide guidance in the selection of the optimum peroxide for a given application. This half-life data is specific to the solvent used and applies to thermal decomposition rather than activated decomposition.

APPLICATION

Norox® TBPB is a highly efficient source of free radicals at moderate to high temperatures. As such, this peroxide compound can be used as a polymerization or co-polymerization initiator to produce polyethylene, polystyrene and polyacrylates. Norox® TBPB should be considered in most all polymerizations of monomers and resins with vinyl unsaturation.

UNSATURATED POLYESTERS

Norox® TBPB is an excellent choice for use as an initiator in the elevated temperature (250°F / 121°C) to (325°F / 163°C) curing of unsaturated polyester resin systems. When Norox® TBPB is used at levels of 0.2% to 1.0% (on weight of resin) in SMC, BMC, and other premixed components, long pot-life has been observed. Norox® TBPB is exceptionally soluble in the monomer-resin system.

The effective operating temperature in curing unsaturated polyester resin systems can be lowered, when using Norox® TBPB, by adding not more than 0.1% of 6% cobalt octoate solution to the resin before adding the peroxide

CAUTION: NEVER MIX PROMOTERS AND PEROXIDES DIRECTLY TOGETHER. EXPLOSIVE DECOMPOSITION WILL OCCUR!

A similar effect can be produced using 2,4-Pentanedione at levels from 0.1% to 0.5% (on weight of resin). Unlike other promoters, 2,4-Pentanedione can be premixed with Norox® TBPB prior to addition to the resin system.

Norox® TBPB can also be combined with other lower operating temperature peroxides such as dibenzoyl peroxide or other peroxyesters to give shorter cure cycles or lower molding temperatures. It should be kept in mind that the use of co-initiators or promoters with Norox® TBPB can result in shorter catalyzed pot-life of the resin compound.

VINYL MONOMERS & POLYMERS

Norox® TBPB can be a highly effective initiator for the polymerization or co-polymerization of methyl methacrylate, acrylonitrile, isoprene, styrene-butadiene, olefin and chlorinated olefin monomers. Low-density polyethylene with excellent mechanical properties can be obtained with initiated with Norox® TBPB. As little as 0.3% Norox® TBPB can be used with operating temperatures that range from (175°F / 79°C) to (275°F / 185°C). High molecular weight polystyrene can be produced by using Norox® TBPB in combination with dibenzoyl peroxide.

OTHER USES

- Curing of alkyd and diallyl phthalate molding compounds.
- Vulcanization of rubber and silicone elastomers.
- Manufacture of drying oils and coatings formulations.
- Organic syntheses requiring free radicals for coupling reactions of olefins, paraffinic compounds, and phenolic derivatives.

NOROX[®] TBPB

STORAGE

- Storage at 80°F or below is recommended.
- Store in original containers **away** from flammables and all sources of heat, sparks, or flames; out of direct sunlight; and **away** from **cobalt naphthenate**, other promoters, accelerators, oxidizing or reducing agents and strong acids or bases.
- **Leaking containers** – Remove and isolate in a safe area. Re-package or dispose immediately (see **spills**).
- **Never** store in refrigerators containing food and/or beverages.
- Consult National Fire Protection Association (NFPA) Code 432 and/or local regulatory agencies.
- Rotate stock, use oldest date first.

HANDLING

- Inform all personnel of procedures for safe handling and review MSDS with them.
- Remove from storage area only the amount needed for one shift.
- Wear safety glasses or goggles and chemical resistant gloves.
- Keep away from heat, flames, and sparks.
- Avoid breathing vapors.
- Dilution is not recommended. Never dilute with acetone.
- **Never** add TBPB directly to promoters or vice-versa, violent decomposition can occur.
- Prevent contamination such as contact with dust, over spray, wood, and combustible material.
- Avoid contact with materials other than polyethylene, polypropylene, Teflon[®], Tygon[®], or similar materials, glass or glass-lined steel, and 304 or 316 stainless steel or equivalent.

FIRST AID

- EYES – Flush immediately with large amounts of fresh water and continue washing for at least 15 minutes. **Medical attention is needed.**
- SKIN – Wash with soap and water.
- INGESTION – Administer large amounts of milk or water and call a physician immediately. Do not induce vomiting. As an aid to the physician, suggest calling your local Poison Control Center.

SPILLS

- Clean up immediately by absorbing with inert material – vermiculite or sand.
 - After absorbing, moderately wet immediately with water and place in a clean plastic bag inside a plastic pail.
 - Dispose of immediately in accordance with local, state, and federal regulations.
- NOTE:** Spilled TBPB, if not immediately cleaned up, can become contaminated and ignite or decompose in a hazardous, violent manner.

FIRE

- Peroxides ignite readily and burn vigorously.
- Use water from a safe distance – preferably with a water-fog nozzle.
- For very small fires, an extinguisher with carbon dioxide, foam, or dry chemical may be effective.
- In case of fire in or near a storage area, cool stored containers with water spray.

PACKAGING, SHIPPING & AVAILABILITY

- The standard package sizes of Norox[®] TBPB are cases of 4x8 lb. and 4x4 kg polyethylene bottles; and 40 lb. or 20 kg Hedpacks. For custom package sizes, please contact your local distributor or Syrgis Performance Initiators, Inc.
- Classification – Please refer to the specific Norox[®] TBPB Material Safety Data Sheet under section 14, Shipping Description.
- Norox[®] TBPB is available through a nation-wide distributor network. Call Syrgis Performance Initiators, Inc. for the name of the distributor in your area.

NOTE: MSDS's for all our products may be requested thru the website www.syrgisperformanceinitiators.com

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