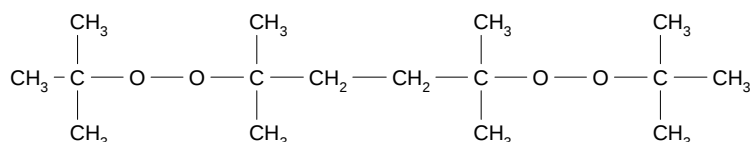


Trigonox[®] 101

Product description

2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane



Molecular weight : 290.4
Active oxygen content peroxide : 11.02%
CAS No. : 78-63-7
EINECS/ELINCS No. : 201-128-1
TSCA status : listed on inventory

Initiator for the production of controlled rheology polypropylene (CR-PP).

Specifications

Appearance : Clear liquid
Color : 50 Pt-Co / APHA max.
Assay : 92.0% min.
Active Oxygen : 10.14% min.
Hydroperoxides as
2,5-dihydroperoxy-2,5-dimethylhexane : 0.3% max.

Characteristics

Density, 20°C : 0.870 g/cm³
Viscosity, 20°C : 6.4 mPa.s
Melting range : 1-10°C

Half-life data

The reactivity of an organic peroxide is usually given by its half-life ($t_{1/2}$) at various temperatures. For *Trigonox* 101 in chlorobenzene:

0.1 hr	at 156°C (313°F)
1 hr	at 134°C (273°F)
10 hr	at 115°C (239°F)

The half-life at other temperatures can be calculated by using the following equations and constants:

$$\begin{aligned}
 k_d &= A \cdot e^{-E_a/RT} & E_a &= 155.49 \text{ kJ/mole} \\
 & & A &= 1.68\text{E}+16 \text{ s}^{-1} \\
 t_{1/2} &= (\ln 2)/k_d & R &= 8.3142 \text{ J/mole}\cdot\text{K} \\
 & & T &= (273.15 + ^\circ\text{C}) \text{ K}
 \end{aligned}$$

Storage

Due to the relatively unstable nature of organic peroxides a loss of quality can be detected over a period of time. To minimize the loss of quality, Akzo Nobel recommends a maximum storage temperature (T_s max.) for each organic peroxide product.

For *Trigonox* 101 T_s max. = 40°C (104°F) and
 T_s min. = 10°C (50°F)

When stored under these recommended storage conditions, *Trigonox* 101 will remain within the Akzo Nobel specifications for a period of at least three months after delivery.

Thermal stability

Organic peroxides are thermally unstable substances, which may undergo self-accelerating decomposition. The lowest temperature at which self-accelerating decomposition of a substance in the original packaging may occur is the Self-Accelerating Decomposition Temperature (SADT). The SADT is determined on the basis of the Heat Accumulation Storage Test.

For *Trigonox* 101 SADT : 80°C (176°F)

The Heat Accumulation Storage Test is a recognized test method for the determination of the SADT of organic peroxides (see Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria - United Nations, New York and Geneva).

Major decomposition products

Acetone, Methane, tert-Amyl alcohol, tert-Butanol, Ethane

Packaging and transport

In North America *Trigonox* 101 is packed in non-returnable, 5 gallon polyethylene containers of 35 lb net weight and 15 gallon drums of 100 lb net weight.

In other regions the standard packaging is a 30-liter HDPE can (Nourytainer®) for 25 kg peroxide solution.

Both packaging and transport meet the international regulations. For the availability of other packed quantities contact your Akzo Nobel representative.

Trigonox 101 is classified as Organic peroxide type D; liquid, Division 5.2; UN 3105.

Safety and handling

Keep containers tightly closed. Store and handle *Trigonox* 101 in a dry well-ventilated place away from sources of heat or ignition and direct sunlight. Never weigh out in the storage room.

Avoid contact with reducing agents (e.g. amines), acids, alkalis and heavy metal compounds (e.g. accelerators, driers and metal soaps).

Please refer to the Material Safety Data Sheet (MSDS) for further information on the safe storage, use and handling of *Trigonox* 101. This information should be thoroughly reviewed prior to acceptance of this product.

The MSDS is available at www.akzonobel-polymerchemicals.com.

Applications

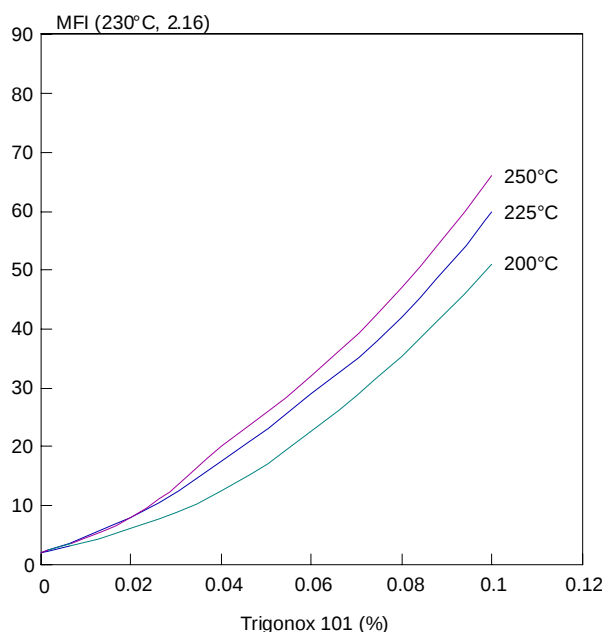
Controlled rheology polypropylene

Trigonox 101 is an efficient peroxide for the degradation of polypropylene (CR-PP) in the temperature range of 200-250°C.

Trigonox 101 allows polypropylene producers great flexibility in controlling a polymer's Melt Flow Index (MFI). Small changes in either peroxide concentration or process temperature can produce significantly different MFI's. Examples of this can be seen in Figure 1 where the relationship between MFI and peroxide concentration is shown at three temperatures.

The experiments represented in this figure were conducted using a Brabender Plasti-Corder® PLE-330 and a Brabender Extrusiograph® 25D/19 mm, with a 4:1 3-zone screw (mixing part 10D, 3D, 9D/3D). Melt flow indices were determined using a Davenport melt flow indexer, model number 3, according to ASTM D 1238, condition L (230°C/2.16 kg). The polypropylene used was stabilized with 0.1% butylated hydroxytoluene (BHT).

Figure 1. *Effect of peroxide concentration on MFI*



Polymerization of styrene

Trigonox 101 can also be used as chaser catalyst to reduce residual monomer in the mass polymerization of styrene.

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