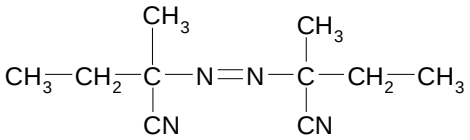
Product Data Sheet

Perkadox® AMBN-gr

Product description

2,2'-Azodi(2-methylbutyronitrile), granules



Molecular weight	: 192.3
Theoretical available Nitrogen	: 14.56%
CAS No.	: 13472-08-7
EINECS/ELINCS No.	: 236-740-8
TSCA status	: listed on inventory

Initiator for the (co)polymerization of styrene, vinyl chloride, vinylidene chloride, acrylonitrile, acrylates and methacrylates.

Specifications

Appearance	: White granules
Assay	: 98.0% min.
Color (2% solution in acetone)	: 20 Pt-Co max.
Water	: 0.5% max.

Characteristics

Density, 20°C	: 1.11 g/cm^3
Bulk density	: 500-600 kg/m^3 (31.2-37.4 lb/ft^3)
Melting point	: 49-51°C

Half-life data

The reactivity of an azo initiator is usually given by its half-life ($t_{1/2}$) at various temperatures. The half-life of *Perkadox* AMBN-gr in chlorobenzene:

0.1 hr	at 104°C (219°F)
1 hr	at 84°C (183°F)
10 hr	at 66°C (151°F)

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

$k_d = A \cdot e^{-Ea/RT}$

$t_{½} = (\ln 2)/k_d$

E_a = 128.93 kJ/mole
A = 1.38E+15 s^{-1}
R = 8.3142 J/mole·K
T = (273.15+°C) K

Storage

Due to the relatively unstable nature of azo initiators a loss of quality can be detected over a period of time. To minimize the loss of quality, AkzoNobel recommends a maximum storage temperature (T_s max.) for each azo initiator.

For *Perkadox* AMBN-gr T_s max. = 25°C (77°F)

When stored under these recommended storage conditions, *Perkadox* AMBN-gr will remain within the AkzoNobel specifications for a period of at least three months after delivery.

Thermal stability

Azo initiators are thermally unstable substances which may undergo self-accelerating decomposition. The lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used for transport is the Self-Accelerating Decomposition Temperature (SADT). The SADT is determined on the basis of the Heat Accumulation Storage Test.

For *Perkadox* AMBN-gr	SADT	: 45°C (113°F)
	Emergency temperature (T_{em})	: 40°C (104°F)
	Control temperature (T_c)	: 35°C (95°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

Nitrogen, 2,3-Diethyl-2,3-dimethylbutanedinitrile, 2-Methylbutanenitrile, 2-Methyl-2-butenenitrile.

Packaging and transport

The standard packaging is a 5 x 5 kg cardboard box and a fiber drum for 50 kg initiator.

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

Perkadox AMBN-gr is classified as self-reactive solid type D, temperature controlled, Division 4.1; UN 3236.

Safety and handling

Keep containers tightly closed. Store and handle *Perkadox* AMBN-gr 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 Safety Data Sheet (SDS) for further information on the safe storage, use and handling of *Perkadox* AMBN-gr. This information should be thoroughly reviewed prior to acceptance of this product.
The SDS is available at www.akzonobel.com/polymer.

Applications

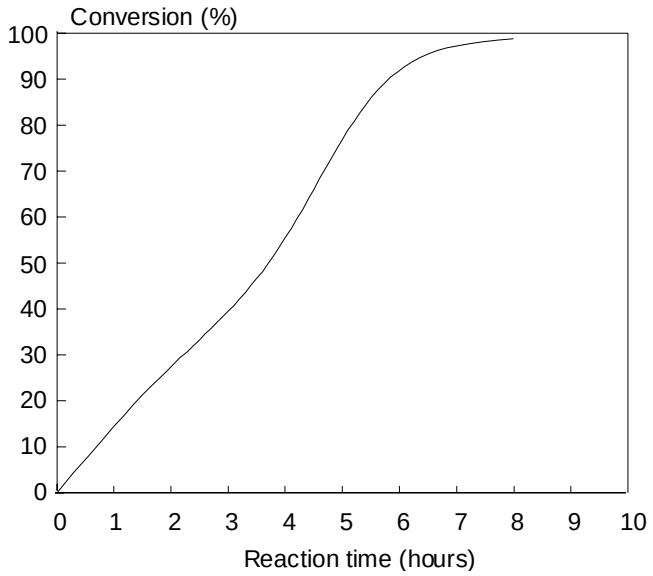
Perkadox AMBN-gr can be used successfully for bulk, solution, suspension and emulsion polymerization of a wide variety of monomers, such as styrene, vinyl chloride, vinylidene chloride, acrylonitrile, acrylates and methacrylates.

Perkadox AMBN-gr does not form oxygenated residues and does not cause oxidative degradation of pigmented or dyed polymer systems. For this reason, the color stability of transparent, dyed polymers, such as polymethylmethacrylate, is improved.

In acrylic paint manufacture, excessive grafting can be a problem when using peroxides. Because the cyano sec-butyl radical from *Perkadox* AMBN-gr shows less tendency to abstract hydrogen from a polymer chain than oxygen centered radicals *Perkadox* AMBN-gr allows the production of resins with a low degree of grafting.

Figure 1 shows the conversion/time curve for the solvent polymerization of methylmethacrylate (MMA) initiated by *Perkadox* AMBN-gr.

Figure 1. Solvent polymerization of MMA by Perkadox AMBN-gr



Solvent	:	toluene
MMA	:	65 wt %
Initiator concentration	:	6 mmol/l on MMA
Temperature	:	70°C

Perkadox AMBN-gr may be used as a replacement of *Perkadox* AIBN [2,2'-Azodi(isobutyronitrile)] where its greater solubility offers a significant advantage. The solubility of *Perkadox* AMBN-gr in a variety of organic solvents is shown in Table 1.

Table 1. Solubility of Perkadox AMBN-gr in solvents, solubility (g) per 100 gram at 25°C

	Perkadox AMBN-gr
Acetone	>150
Methanol	160
Ethanol	75
Isopropanol	83
Toluene	>150
Ethylacetate	>100
Heptane	2.8
Water	<0.1

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