

## TECHNICAL DATA SHEET

# 3-METHYLAMINO-1,2-PROPANEDIOL (MAPD)

MAPD is synthesized by reacting 3-chloro-1,2-propanediol (CPD) with monomethyl amine in alkaline environment by adding sodium hydroxide. Afterwards, the product undergoes a series of purification steps.

### Description

**Product name:** 3-Methylamino-1,2-propanediol

**Synonyms:** MAPD, 1-Amino-2,3-propanediol, Methylaminopropanediol

**CAS No:** 40137-22-2

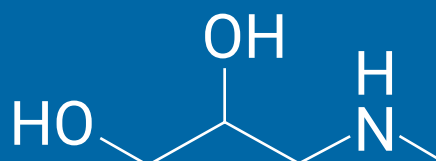
**EC No:** 254-809-0

**REACH Reg. No.:** 01-2119964445-30-0000

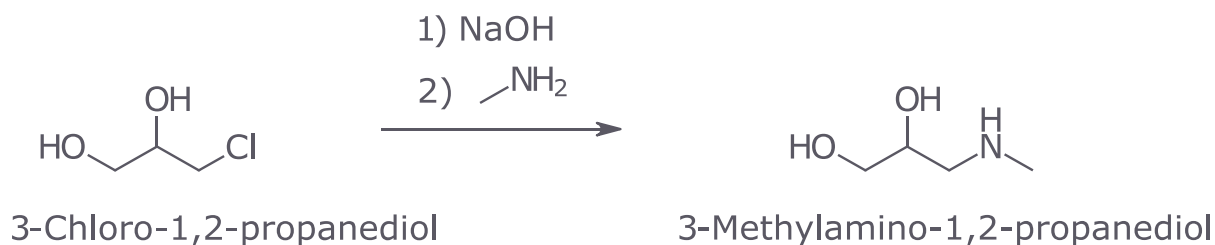
**Formula:** C<sub>4</sub>H<sub>10</sub>NO<sub>2</sub>

**Molecular weight:** 105.14

### STRUCTURE



## ROUTE OF SYNTHESIS



## PHYSICAL AND CHEMICAL PROPERTIES



**State of aggregation**  
Liquid



**Color**  
Colorless



**Smell**  
Amine odor,  
prickling



**Solubility**  
Soluble in:  
Alcohols, Miscible  
in: Water



**pH**  
~11.5



**Boiling point**  
~247 °C

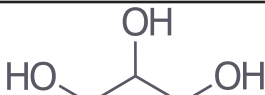
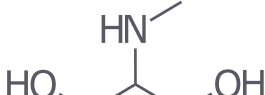
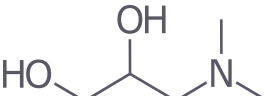
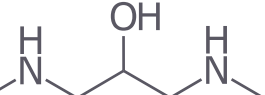
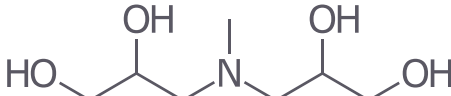
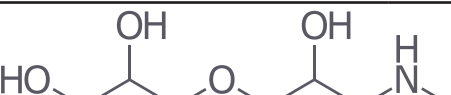


**Flash point**  
~152 °C



**Density**  
1.09 g/ml

## TYPICAL QUALITY

Parameter	Structure	Typical values
<b>Appearance</b>		Clear colorless/weak yellow viscous liquid.
<b>Assay by titration</b>		98-102% (w/w)
<b>Water content</b>		~0.1% (w/w)
<b>Methanol</b>		<100 ppm
<b>Optical rotation</b>		Racemic mixture
<b>GC analysis (by area percent)</b>		
<b>Glycerol</b>		~0.05
<b>Methylserinol (2-methylamino-1,3-propanediol)</b>		~0.28
<b>3-Dimethylamino-1,2-propanediol</b>		~0.01
<b>1,3-Di(methylamino)-2-propanol</b>		~0.03
<b>Tertiary amines</b>		~0.4
<b>Dimeric ethers</b>		~0.02

## GC INSTRUMENT CONDITION

<b>Column</b>	DB 1701, 30 m, 0.32 mm ID, 0.25 µm film thickness
<b>Carrier gas</b>	Helium at constant pressure 9,3 PSI
<b>Split</b>	20 - 25 mL/min
<b>Injection</b>	20 - 25 mL/min
<b>Run time</b>	1.0 µL
<b>Temperature program</b>	30 minutes 90 °C 8 °C/min to 225 °C
<b>Detector</b>	FID 260 °C
<b>Injector</b>	200 °C
<b>Derivatization</b>	Trifluoroacetic anhydride (TFAA)

## PACKAGING AND TRANSPORT

MAPD can be supplied in 20' ISO containers. The tank containers are insulated with insulation thickness above standard which extend temperature hold time and reduces temperature changes. The containers are fitted with heating and cooling coils and an electric heat tracing system. The tank material is stainless steel and comes with three closures, a pressure relief valve and a valve for Oxygen or Nitrogen. The tanks come with walkways and collapsible handrails, for safe operation.

MAPD can also be supplied in 200 kg drums, in 1000 l PE IBC or otherwise agreed. Due to viscosity, product supplied in drums and IBC may require heating to discharge.

## STORAGE AND SHELF LIFE

MAPD has a shelf life exceeding 1 year in normal storage conditions. The expiration date is minimum 1 year after production, and the product should be retested after this period.

### Retest date

If stored closed in original container, heated at temperatures not exceeding 40 °C, retesting is suggested after 12 months of storage.



## LEAD TIME

Readily available from stock.

## SAFETY

CLP-classification: Skin Corr. 1C; H314

- Most serious harmful effects: Causes severe skin burns and eye damage.



## CERTIFICATIONS

Borregaard Pharma Intermediates is certified in accordance with several standards:

- ISO 9001 Quality Management
- ISO 14001 Environmental Management
- ISO 50001 Energy Management



## **BSE/TSE**

No material of animal origin is used during the manufacture of MAPD. This includes all starting substance, reagents and solvents.

## **GENOTOXICITY**

MAPD does not contain mutagenic impurities. Carcinogenic and genotoxic potential is not expected.

## **KOSHER**

Not formally verified.

## **HALAL**

MAPD does not contain any ingredient of animal origin. Pork origin or parts there of (enzymes, hair, bacon, etc.) are not used in the manufacturing of the product. No processing aid, additive or carrier of animal origin has been used in the production of this product.

## **ALLERGENS**

Our product is free from allergens.

## **GMO**

MAPD does not contain material of Genetically Modified Organism origin. The above material is not manufactured using any materials derived from GMOs. The above material was not exposed to any material of GMO origin including media, Lubricants and plasticizers during manufacture.

## **MELAMINE**

This product is not at risk for Melamine contamination.

## **METAL CATALYSTS**

No metal catalysts are used in the production of MAPD.

## **RESIDUAL SOLVENTS**

Methanol is used in the manufacturing process of MAPD. No ICH Class-1 Solvents are used.

## **NITRITES**

Nitrites or Nitric acids are not used in the manufacturing process of MAPD.

## **N-NITROSO IMPURITIES**

Based on analysis, there is a minimal risk of formation of NDMA, NDEA, NMPA and other N-nitroso impurities in the route of synthesis of MAPD.



## ABOUT US

Borregaard has one of the world's most advanced and sustainable biorefineries.

By using natural, sustainable raw materials, Borregaard produces advanced and environmentally friendly biochemicals that can replace oil-based products. Borregaard also holds strong positions within ingredients and fine chemicals.

Borregaard employs 1100 man-years in plants and sales offices in 16 countries throughout Europe, Americas, Asia and Africa.

## BORREGAARD - PHARMA INTERMEDIATES

Borregaard's business segment Pharma Intermediates manufactures pharma intermediates for global pharmaceutical and related markets. We are located in Sarpsborg, Norway where we have two large commercial plants.

Our core products are 3-Chloro-1,2-propanediol (CPD), 3-Amino-1,2-propanediol (APD), 3-Methylamino-1,2-propanediol (MAPD) and 1,3-Diamino-2-propanol (DAP). Our expertise allows us to concentrate on such applications as contrast media and advanced intermediates. Our plants are operating 24/7 365 days a year, and Borregaard ensures our customers a stable manufacturing process which gives high quality products.

## SUSTAINABILITY

Borregaard Pharma Intermediates has a high focus on continuous improvements to reduce our environmental impact, lower our energy consumption and increase the capacity in our plants.

Our energy comes from renewable Norwegian hydroelectric power and internally generated steam generated from burning household garbage and waste from our biorefinery.

Life cycle analysis of comparable processes has proved CPD, APD and MAPD from Borregaard to have a substantially better environmental profile compared to Asian producers mainly due to waste treatment and not using steam/energy originating from coal.

Up to 50% of carbon in final formulated contrast media may have its origin from Borregaard – and we are in a unique position if our customers in future would like to enforce strict sustainability. Half of the amount of carbon in formulated contrast media like Iohexol originates from Borregaard products - we are well positioned if our contrast media customers show increased interest in sustainability.

The key raw material for CPD, APD and MAPD is oil-based epichlorohydrin. Epichlorohydrin can be produced from renewable raw materials and Borregaard is running annual campaigns using renewable epichlorohydrin.

For more info please visit [www.borregaard.com](http://www.borregaard.com)

