
Alkylene Oxide Adducts of Bisphenol-A
Raw Materials for Resins, Raw Materials for Organic Intermediates, Resin
Modifiers

NEWPOL BPE Products

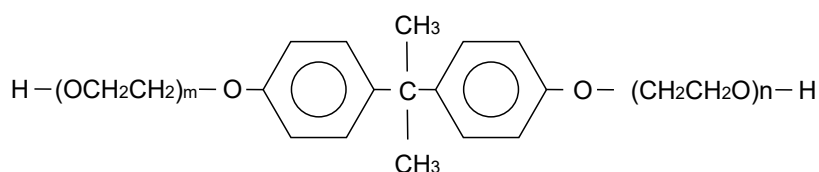
NEWPOL BP Products

Preface

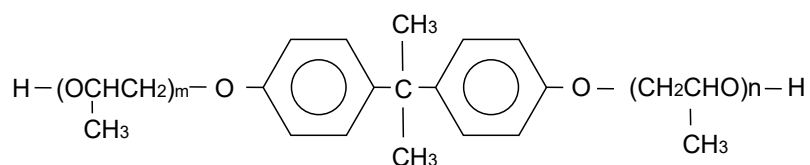
NEWPOL BPE products and NEWPOL BP products are ethylene oxide and propylene oxide adducts of bisphenol-A, respectively. The structural formulas are shown below. These products are useful for a wide range of applications such as raw materials for polyester, polyurethane and other resins, raw materials for organic intermediates including (meth) acrylates derivatives and glycidyl ether derivatives, water-soluble heating media and thermal storage media.

Structural Formula

NEWPOL BPE Products



NEWPOL BP Products



Typical Property

1. Typical Properties

The typical properties of NEWPOL BPE products and of NEWPOL BP products are shown in Tables 1-a and 1-b. These values are representative.

Table 1-a. Typical Properties

Product Name	Appearance (20±5 °C)	Color (hazen)	Hydroxyl Value	Acid Value
NEWPOL BPE-20	White lump	30 *1	344	0.10
NEWPOL BPE-20 (F)	White lump	30 *1	343	0.10
NEWPOL BPE-20NK	White lump	20 *1	345	0.02
NEWPOL BPE-40	Colorless liquid	20	276	0.05
NEWPOL BPE-60	Colorless liquid	10	228	0.05
NEWPOL BPE-100	Colorless liquid	10	167	0.06
NEWPOL BPE-180	Colorless liquid	10	110	0.02
NEWPOL BP-2P	Colorless liquid (solid at 20 °C)	40	322	0.60
NEWPOL BP-23P	Colorless liquid (solid at 20 °C)	20	310	0.03
NEWPOL BP-3P	Colorless liquid	20	280	0.02
NEWPOL BP-5P	Colorless liquid	10	211	0.02

*1 Measured at 110 °C.

Table 1-b. Typical Properties

Product Name	Viscosity at 60 °C mPa·s	pH	Water Content *4	Mole distribution (EO, PO) *5 %				
				1 mole	2 mole	3 mole	4 mole	5 mole
NEWPOL BPE-20	/	7.2 *2	0.2	ND	82.4	15.8	1.8	ND
NEWPOL BPE-20 (F)	/	7.3 *2	0.2	ND	82.4	15.8	1.8	ND
NEWPOL BPE-20NK	/	7.5 *2	0.2	ND	82.6	15.7	1.7	ND
NEWPOL BPE-40	9,000 (25 °C)	6.5 *2	0.04	/	/	/	/	/
NEWPOL BPE-60	174	6.3 *3	0.04	/	/	/	/	/
NEWPOL BPE-100	27.5 (99 °C)	5.9 *3	0.04	/	/	/	/	/
NEWPOL BPE-180	130	6.1 *3	0.04	/	/	/	/	/
NEWPOL BP-2P	1,600	6.5 *2	0.03	ND	95.3	3.9	0.8	ND
NEWPOL BP-23P	1,340	6.8 *2	0.03	ND	82.5	15.2	2.3	ND
NEWPOL BP-3P	2,150 (50 °C)	6.9 *2	0.03	ND	38.1	40.8	17.0	4.1
NEWPOL BP-5P	5,500 (25 °C)	6.8 *2	0.03	/	/	/	/	/

*2 Measured after a 10 g sample was added to the following 60 mL solution.
Solution: water / isopropanol=60 / 100 (volume ratio), pH7

*3 Measured using a 1 wt % aqueous solution.

*4 Measured according to the Karl Fischer method.

*5 Measured using gas chromatography.

Application

1. Examples of Applications (excerpts from literature, etc.)

NEWPOL BPE products and NEWPOL BP products are applicable to a wide range of fields as shown in Table 2.

Table 2. Examples of Applications (excerpts from literature, etc.)

Applications		Effects	References	
Raw Materials for Resin or Resin Modifiers	Unsaturated polyester	Corrosion resistance FRP	–	
		Binder for fiberglass	–	
		Hybrid water-based paint	Improvement of hardness and impact resistance	1
		Paint for steel plate	–	2,3
		Laminating adhesive	–	4
		UV curable paint resin	–	5
	Polyurethane	Powdered paint	Improvement of adhesion, hardness and impact resistance	6 to 9
		Polyisocyanurate foam	Improvement of brittleness	10
		Urethane modified acrylate adhesive	Improvement of adhesion and flexibility	11,12
		Photo-curable resin	Improvement of hardness and water resistance	13
		Binder for casting sand	–	14
	Polyester	Engineering plastic	Improvement of heat resistance and chemical resistance	15
		Film	Improvement of water resistance	16
		Heat-resistant resin	–	17
		Phosphorous polymer	Imparts flame resistance	18
Toner resin		–	19 to 21	
Resin Additives	Lubricant for Polyvinyl chloride Lubricant for ABS resins		Improvement of melt flow rate	–
	Additives for melamine resins		Improvement of lubricating properties	22
	Lubricant for PPO resins		–	–
	Pigment dispersant for polyester resins		–	–
Raw Materials for Intermediates	(meta) acrylate derivatives	Anaerobic adhesive	–	23 to 27
		Photo-curable resin	–	28
		Vehicles for printing ink	Improvement of water resistance, shrinking resistance and luster	–
		Adhesive for dental materials	–	29 to 31
	Glycidyl ether derivatives		–	–
	Fatty acid ester derivatives	Textile oil	Improvement of heat resistance	–
Additives for melamine resins		Improvement of lubricity	22	
Others	Dissolving auxiliary for dyes		–	32
	Thermal storage medium		–	33
	Water-soluble heating medium		–	34
	Materials for heat sensitive recording paper		Improvement of the clarity of pictures on paper	35,36

2. An Example of Applications for Raw Materials of Unsaturated Polyester Resin Type Hot Melt Adhesives

Materials:	mass ratio	(mole ratio)
(1) NEWPOL BPE-20NK :	482	(1.83)
(2) Fumaric acid :	186	(2.00)
(3) Hydroquinone :	0.34	
(4) Glycerin :	14.7	(0.20)

Method:

- Mix (1), (2) and (3) using a reactor and melt them.
- Polymerize them by dehydration condensation at normal pressure and then continue this process at reduced pressure.
- Add (4) to them when the acid value becomes 20 or lower.
- Finish the process when its softening point becomes 110 °C or higher.

Appearance of Synthetic Hot Melt Adhesive :

Appearance: Pale yellow solid
Softening point: 112 °C
Tg: 48 °C
Weight-average molecular weight (GPC): 45,000

3. An Example of Applications for Raw Materials for Polyester Resin Type Paint

Materials:	mass ratio	(mole ratio)
(1) NEWPOL BPE-20 :	189.8	(0.56)
(2) Ethylene glycol :	107.2	(1.65)
(3) Dimethyl terephthalate :	203	(1.00)
(4) Zinc acetate :	0.09	
(5) Antimony trioxide :	0.09	

Method:

- Mix the above materials using a reactor and melt them.
- Polymerize them by dehydration condensation at normal pressure and continue this process at reduced pressure
- Finish the process when the Tg is 70 °C or higher.

Appearance of Resins for Synthetic Polyester Resin Type Paint :

Appearance: Pale yellow solid
Tg: 73 °C
Weight-average molecular weight (GPC): 102,000

Preparation for Paint :

Add melamine resin and pigments (organic solvent, titanium oxide, etc.) to the obtained resin.

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Japanese Kokai Publication is abbreviated to J. Kokai P.
Japanese Kokoku Publication is abbreviated to J. Kokoku P.

Important :

Before handling these products, refer to the Safety Data Sheet for recommended protective equipment, and detailed precautionary and hazards information.

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