AB 07/01/24
TW 07/02/24
AMS 11/07/24

Chemistry Report for Case # P-23-0036 (Version 1)

General

Submitter: Elantas PDG, Inc.

Contact: Todd Thomas | **Contact Telephone No.:** (314) 621-5700 Ext. 113

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Chemist: E. Akinboye | **Contractor Support:**

PV Init (kg/yr): 24000.0 | **PV Max (kg/yr):** 34000.0

Binding Option: ☐ | **Exposure-Based Review:** ☑

Manufacture: ☐ | **Import:** ☑

Chemical ID

CAS Number: 2794200-69-2

Chemical Name: Castor oil, polymer with dicyclopentadiene, maleic anhydride, 2-methyl-1,3-propanediol, 3a,4,7,7a-tetrahydro-2-(2-hydroxyethyl)-1H-isoindole-1,3(2H)-dione and triethylene glycol

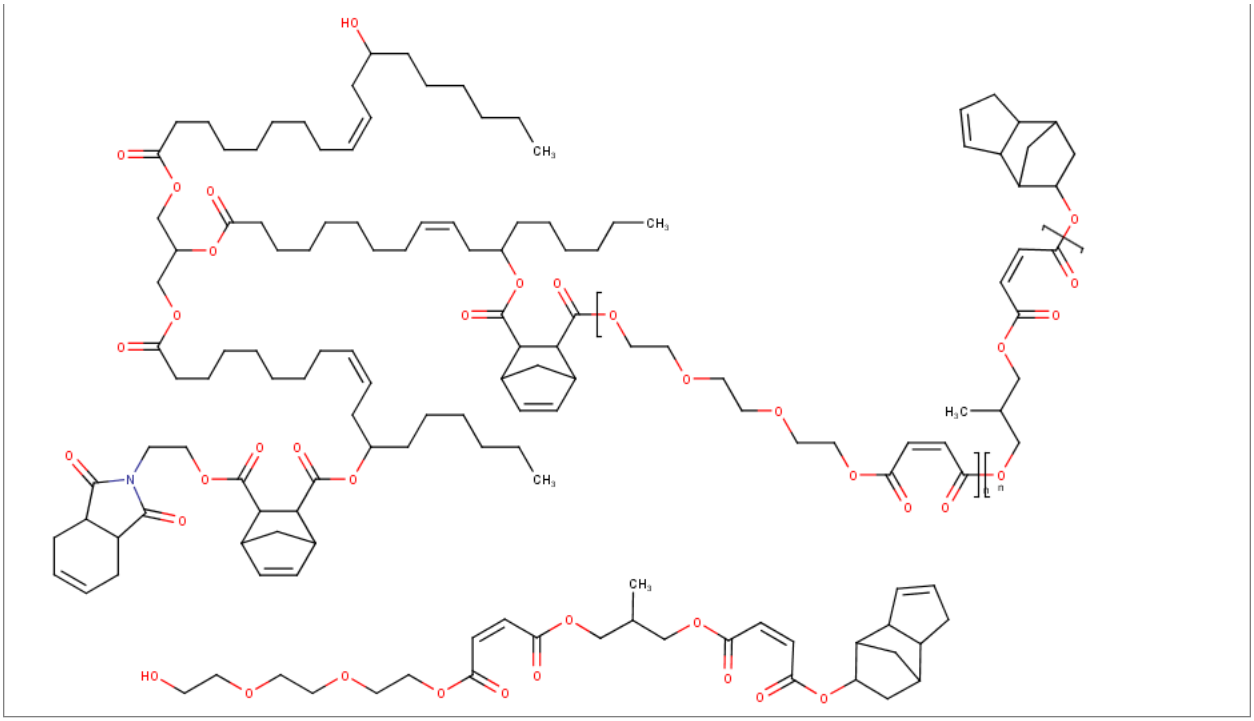
Trade Name: None

IES Order: 482267

Generic Name: not [redacted]

Chemistry Assessor: Emmanuel Akinboye

Chemical Structure



Physical Chemical Properties

Molecular Formula:C, H, N, O

Molecular Weight:725.0

% < 500:22.0

% < 1000:40.0

MP:

MP Estimate:

BP:

BP Pressure:

BP Estimate:>400

VP (Torr):

VP Estimate (Torr):<0.000001

Water Solubility (g/L):

Water Soluble Estimate (g/L): Dispersible/<0.0000

Log P:

Log P Estimate:

Physical State — Neat:
Liquid

Physical State — Manuf:
NK: Import

Physical State — Processing:
Solution: 57% PMN material in coating formulation

Physical State — End Use:
Destroyed

Additional Chemical Info:
NAVG MW = 725 g/mol with 22% < 500 and 40% < 1000 by GPC.
The large structure as drawn on page 1 of this report has a MW of 1970 g/mol. The small structure shown on page 1 of this report has a MW of 551 g/mol. The castor oil feedstock has a MW of 933 g/mol.
Submitted Properties: Flash Point > 94 C; Kinematic Viscosity > 21 mm^2/s at 40 C; Density = 1.0 g/cc.
Properties Submitted in [redacted]: Flash Point > 99 C; Autoignition Temperature = 350 C; Dynamic Viscosity = 6500-7500 mPa*s at 23 C; Kinematic Viscosity > 21.5 mm^2/s at 40 C; Density = 1.09 g/cc.
Estimated Properties: BP > 400 C (Polymer); VP < 0.000001 torr (Polymer); WS = Dispersible/< 0.000001 g/L (Low MW components with triethylene glycol / High MW components with castor oil).
EPI Estimated Properties for Component with MW = 551 and SMILES of OCCOCCOCCOC(=O)C=CC(=O)OCC(C)COC(=O)C=CC(=O)OC1CC2CC1C3C2CC=C3: BP = 585 C; VP = 4.5E-13 torr, WS = 0.022 g/L, log Kow = 3.95.

Uses

Consumer Use? ☐
Intended Uses (ICB):
Intended Use: Resin used in an electrical insulation coating to insulate electrical components (motors) in automobiles.

Analogues (same use): Analogue [redacted]

Patents (same use): None found.

Other Uses:
Analogues (other use): None found.

Analogues (same use and other use): None found.

Patents (other use): None found.

Reaction Description

The PMN material is imported and a manufacturing process diagram is not included. The reaction described below is taken from the list of feedstocks on PMN page 5.

1H-Isoindole-1,3(2H)-dione, 3a,4,7,7a-tetrahydro-2-(2-hydroxyethyl)-; 2,5-Furandione; 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-; 1,3-Propanediol, 2-methyl-; Ethanol, 2,2'-[1,2-ethanediylbis(oxy)]bis-; and Castor oil are reacted together in the presence of Stannane, dibutyloxo- and water to give the PMN material.

From same case [redacted]: The dicyclopentadiene reacts into the structure in two possible ways. The first is an addition reaction of an acid into the double bond of the bicyclic ring of dicyclopentadiene to give the terminating ester. The second is a two-step process where dicyclopentadiene undergoes a retro-Diels-Alder reaction to form cyclopentadiene, and then the cyclopentadiene undergoes a Diels-Alder reaction with maleic anhydride or its derivatives to form nadic anhydride.

Pollution Prevention Analysis(P2 Analysis:)

None.

Analogs

Same as [redacted]

Comments/Telephone Log

Attachments	Update/Upload Time	Update/Upload By

Historic Documents

Attachments	Version Number	Updated/Uploaded Time	Updated/Uploaded By

Current Version Comments

Comment	Update/Upload Time	Update/Upload By