

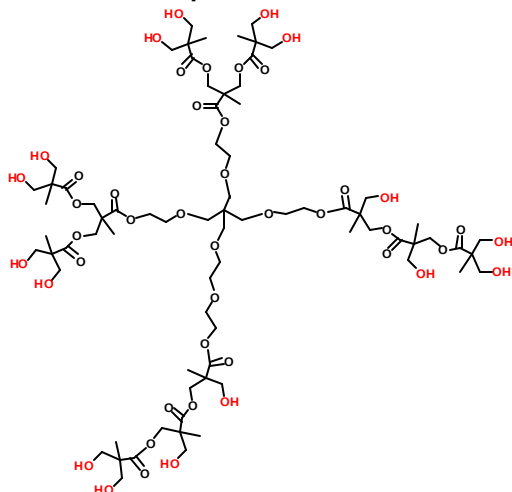
Technical Bulletin

Hyperbranched bisMPA polyester-16-hydroxyl, generation 2

Catalog Number **686603**
Store at Room Temperature
Technical Bulletin AL-245

Synonym: ALH-16-OH Hyperbranched Polymer
CAS RN 326794-48-3

Product Description



Theoretical MW: 1749.79 g/mol
Average Molecular Formula: $C_{75}H_{128}O_{45}$
Number of hydroxyl groups: 16 (average)

This polydisperse compound has multiple surface hydroxyl groups. The hydroxyl groups are selectively reactive with anhydrides or acyl halides. This material can be used as:

- precursor for synthesis of dendritic-linear materials
- polyfunctional initiator for ring-opening polymerizations
- polyfunctional cross-linker for thermosets

High degree of branching results in high solubility and low viscosity (solution and melt). The compound is transparent to light in the UV/Vis wavelength region.

The product is highly purified by multiple precipitations and is supplied as a freeze-dried, white powder. It may contain traces of methanol or ether.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

The product is soluble in polar organic solvents (warm THF, DMSO, DMF, and methanol) and water.

Storage/Stability

Store the product at room temperature.

Procedure

Acylation of the hydroxyl end groups:

1. Dissolve the hyperbranched polyester in THF (calculate n_{OH} using the theoretical MW), and add triethylamine ($1.2 \times n_{OH}$) and a catalytic amount of 4-(dimethylamino) pyridine (Catalog Number 522805).
2. Put the flask on an ice/water bath and add the acylation reagent while stirring. Let the reaction reach completion and perform work-up as required (typically through extraction, requires change of solvent).
3. Evaporate to dryness using a rotary evaporator.

Hydroxyl groups as initiators for ring-opening polymerization of lactones:

1. Dissolve the dried hyperbranched polyester in toluene and add the required amount of tin(II) 2-ethylhexanoate [$Sn(Oct)_2$] (Catalog Number S3252) and distilled ϵ -caprolactone (Catalog Number 241296) in the required amount. Exclude moisture by three repetitive vacuum cycles.
2. Put the flask in a preheated oil bath and let the polymerization reach the desired conversion.
3. Dissolve the product in THF and precipitate into cold methanol. Isolate the product by filtration.

Related Products

Hyperbranched bis-MPA polyester-32-hydroxyl,
generation 3 (Catalog Number 686581)

Hyperbranched bis-MPA polyester-64-hydroxyl,
generation 4 (Catalog Number 686573)

References

1. Claesson, H. et al., Synthesis and Characterization of Star Branched Polyesters with Dendritic Cores and the Effect of Structural Variations on Zero Shear Viscosity. *Polymer*, **43**, 3511-3518 (2002).
2. Arce, E. et al., Glycodendritic Structures Based on Boltorn Hyperbranched Polymers and Their Interactions with *Lens culinaris* Lectin. *Bioconjugate Chem.*, **14**, 817-823 (2003).

IK,MAM 09/07-1

Aldrich brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.