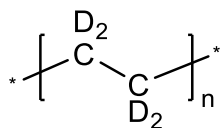


Sample Name: Deuterated Poly(ethylene-d4)

Sample #: P43350-dPE

Structure:



Composition:

$M_n \times 10^3$ (g/mol)	M_w/M_n
40.0	1.01

Thermal properties:

Melting point, T_m	Crystallization point, T_{cr}
101°C	81 °C

Synthesis procedure:

The polyethylene-d₄ was obtained by deuteration of poly(1,4-butadiene-d₆), which was synthesized by living anionic polymerization of butadiene-d₆ in non-polar solvent.

Characterization:

Deuterium NMR spectroscopy was used to confirm the structure of polybutadiene-d₆ rich in 1,4-addition.

The complete deuteration of the product was confirmed by FT-IR spectroscopy analysis by disappearance of alkene double bond ($\text{C}=\text{C}$ at 971 cm^{-1}).

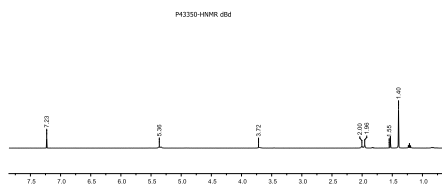
The molecular weight and polydispersity index were obtained by size exclusion chromatography (SEC) of poly(1,4-butadiene-d₆) precursor using THF as an eluent; and the molecular weight of polyethylene-d₄ was calculated accordingly.

Thermal analysis was performed on TA Instruments Q100 differential scanning calorimeter (DSC) under a nitrogen atmosphere at a scan rate 10 °C/min .

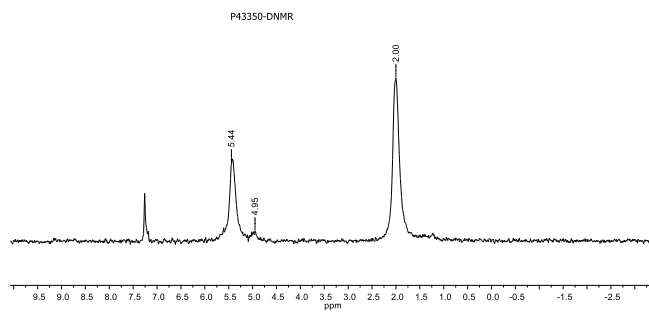
Solubility:

Polyethylene-d₄ is soluble in hot toluene and xylene.

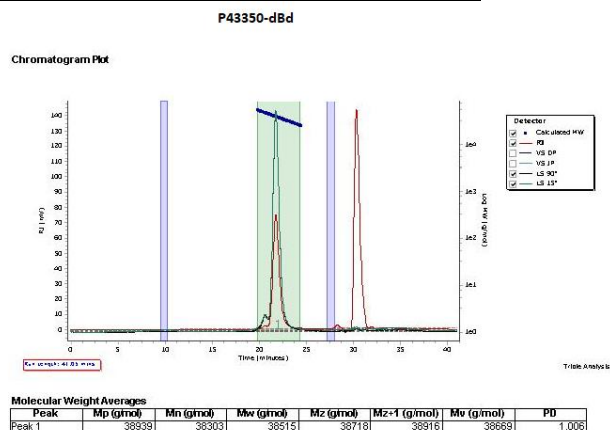
¹H-NMR spectrum of dPBd precursor:



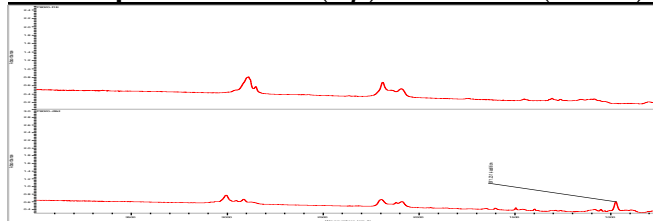
D-NMR spectrum of PBd precursor:



SEC chromatogram of dPBd precursor:



FT-IR spectra of dPE (top) and dPBd (bottom):



DSC thermogram:

heating (bottom) and cooling (top) scans at 10 °C/min .

Sample: P43350

DSC File: C:\TA\Data\DSC\Deuterated\PE\P43350.001

