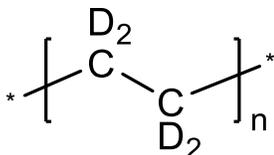


Sample Name: Deuterated Polyethylene-d<sub>4</sub>

Sample #: P42237C-dPE

**Structure:**



**Composition:**

$M_n \times 10^3$ (g/mol)	$M_w/M_n$
210.0	1.05

**Thermal properties:**

Melting point, $T_m$	Crystallization point, $T_{cr}$
102 °C	86 °C

**Synthesis procedure:**

The polyethylene-d<sub>4</sub> was obtained by deuteration of poly(1,4-butadiene-d<sub>6</sub>), which was synthesized by living anionic polymerization of butadiene-d<sub>6</sub> in non-polar solvent.

**Characterization:**

Deuterium NMR spectroscopy was used to confirm the structure of polybutadiene-d<sub>6</sub> rich in 1,4-addition.

The complete deuteration of the product was confirmed by FT-IR spectroscopy analysis by disappearance of alkene double bond (C=C at 971 cm<sup>-1</sup>).

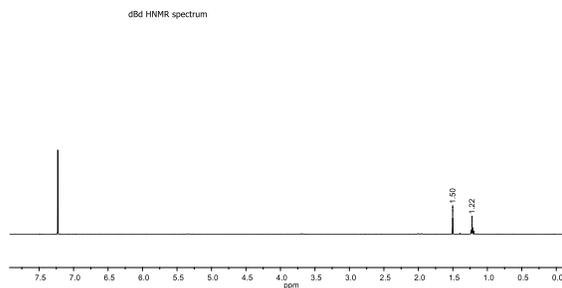
The molecular weight and polydispersity index were obtained by size exclusion chromatography (SEC) of poly(1,4-butadiene-d<sub>6</sub>) precursor using THF as an eluent; and the molecular weight of polyethylene-d<sub>4</sub> was calculated accordingly.

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

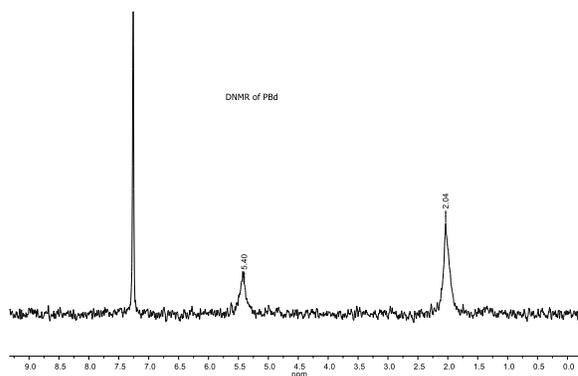
**Solubility:**

Polyethylene-d<sub>4</sub> is soluble in hot toluene and xylene. The obtained solution has light ivory color; this coloration is due to the presence of trace amount (we expect <5–6 ppm) of the Wilkinson catalyst used in synthesis (and which is hard to remove from the final product).

**H NMR spectrum of the polymer used for deuteration:**

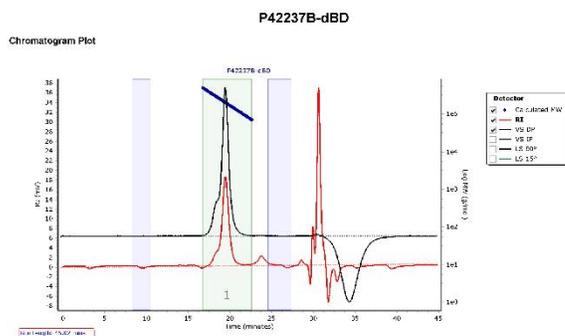


**D NMR spectrum of the polymer used for deuteration:**



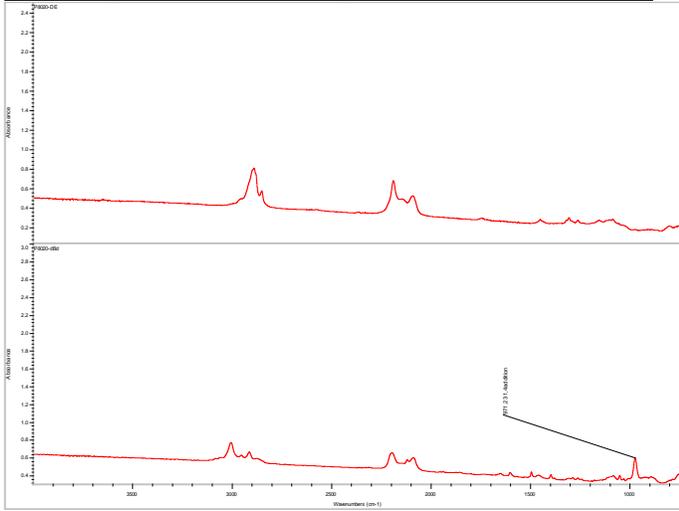
**SEC elugram of the polymer used for deuteration:**

Agilent GPC/SEC Software



Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	208430	202406	219038	223363	234379	220844	1.052

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



**DSC thermogram:**

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

