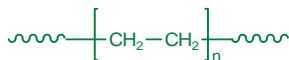


Sample Name:

**Polyethylene (obtained from the hydrogenation of Poly butadiene rich in 1,4 microstructure)**

Sample #: **P1973-E**

**Structure:**



**Composition:**

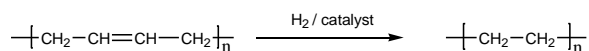
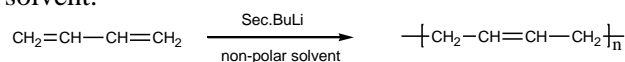
$M_n \times 10^3$ (g/mol)	$M_w/M_n$
26.0	1.05

**Thermal properties:**

Melting point, $T_m$	Crystallization point, $T_{cr}$
109 °C	95 °C

**Synthesis procedure:**

Polyethylene is made from the hydrogenation of 1,4-polybutadiene. 1,4-polybutadiene is synthesized by living anionic polymerization of butadiene in non-polar solvent.



**Characterization:**

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. The SEC instrument calibrated with poly butadiene standards. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

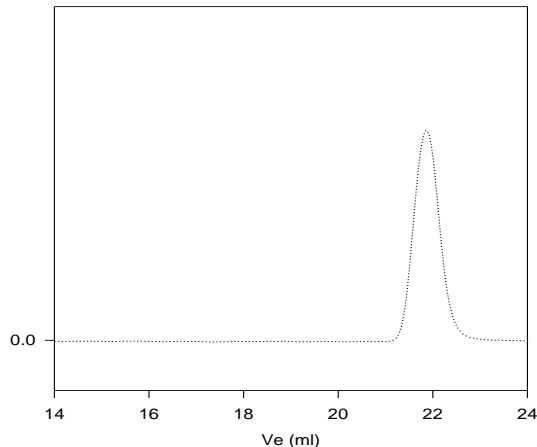
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The melting temperature ( $T_m$ ) was taken as the maximum of the endothermic peak whereas the crystallization temperature ( $T_c$ ) was considered as the minimum of the exothermic peak.

**Solubility:**

Polyethylene is soluble in hot toluene and hot xylene. The polymer is insoluble in hexane, methanol and ethers.

**SEC chromatogram of polymer: precursor:**

**P1957-Bd(precursor for P1973-E)**



Size exclusion chromatography of polybutadiene with respect to polybutadiene standards (precursor for P1973-E):  
 $M_n=25000$ ,  $M_w=26100$ ,  $M_w/M_n=1.05$   
Molecular weight of Polyethylene  $M_n$ : 26000  $M_w/M_n$ :1.05

**DSC thermogram:**

1<sup>st</sup> heating (*bottom*) and 2<sup>nd</sup> cooling (*top*) scans at 10 °C/min.

