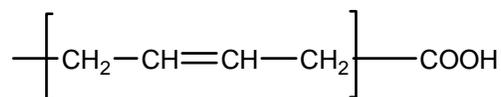


**Sample Name: Carboxy-terminated Polybutadiene (1,4-rich microstructure)**

**Sample #: P2950-BdCOOH**

**Structure:**



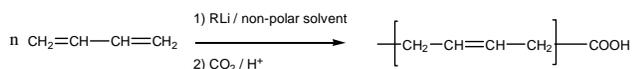
**Composition:**

Mn x 10 <sup>3</sup>	PDI
2.5	1.04

COOH functionality:	>95 %
PBd 1,4-addition:	87 %

**Synthesis Procedure:**

1,4-addition carboxy-terminated polybutadiene was prepared by anionic living polymerization of butadiene in non-polar media (or in presence of 10% diethyl ether), followed by termination of the polymerization with dried CO<sub>2</sub>. The scheme of the reaction is presented below:



**Characterization:**

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. 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.

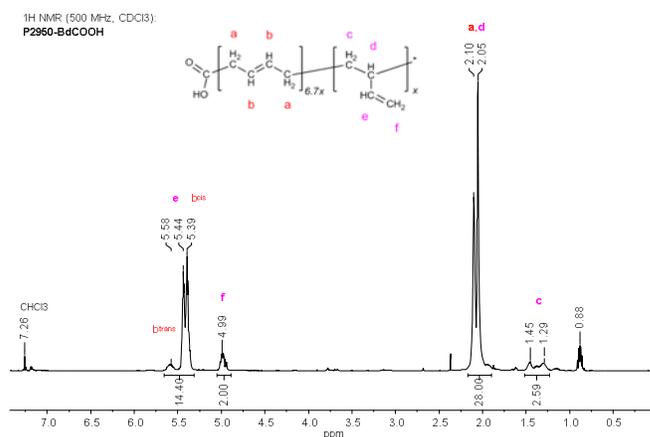
**Functionality:** The degree of polymer functionality was determined by acid-base titration.

**Microstructure:** The ratio between 1,4- and 1,2-addition was calculated by <sup>1</sup>H NMR spectroscopy.

**Solubility:**

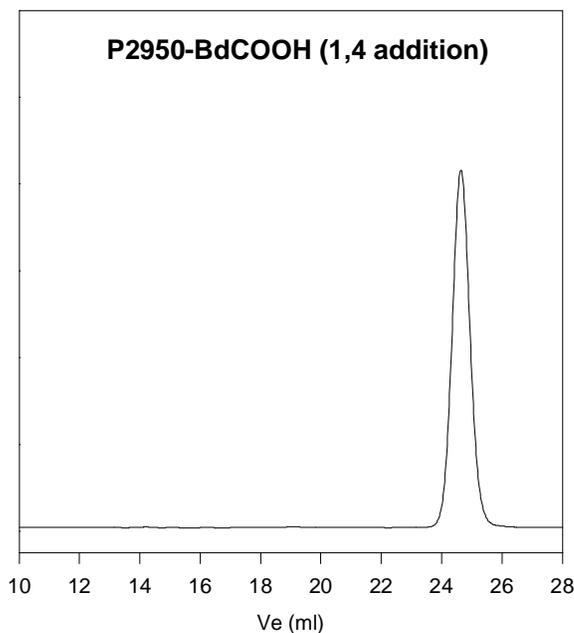
COOH terminated polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl<sub>3</sub>. It precipitates from methanol, ethanol and water.

**<sup>1</sup>H NMR spectrum:**



Ratio 1,4- to 1,2-addition = 0.87 : 0.13

**SEC elugram:**



Size exclusion chromatography of polybutadiene before termination with CO<sub>2</sub>.

M<sub>n</sub>=2500 M<sub>w</sub>=2600, PI=1.04, functionality=>0.95%