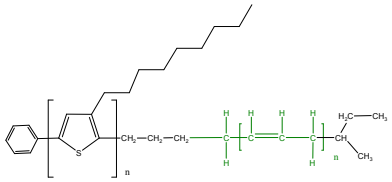
Sample Name:

Poly(Butadiene-b-3-Nonyl thiophene) Poly Bd rich in 1,4 addition

Sample #: **P10495-3NThBd**

Structure:



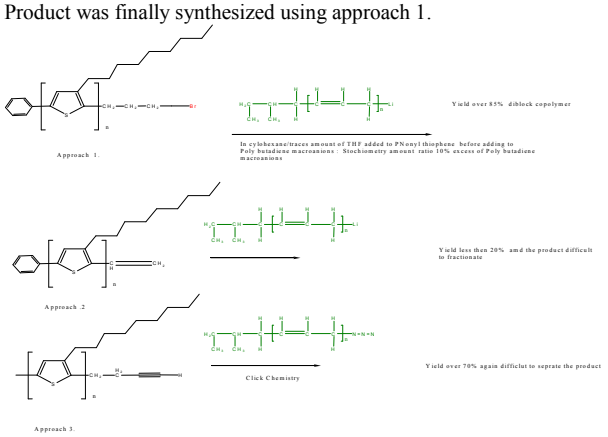
Composition:

Mn x 10^3 3-NTh-b-Bd	PDI
4.5-b-6.0	1.4

Synthesis Procedure:

Three possible routes were explored as follows:

Product was finally synthesized using approach 1.

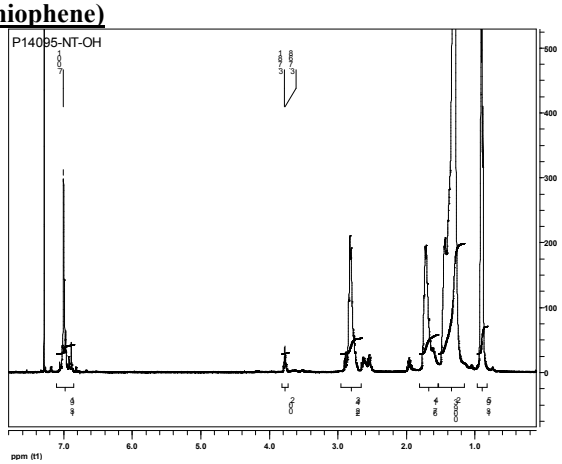


Purification of polymer:

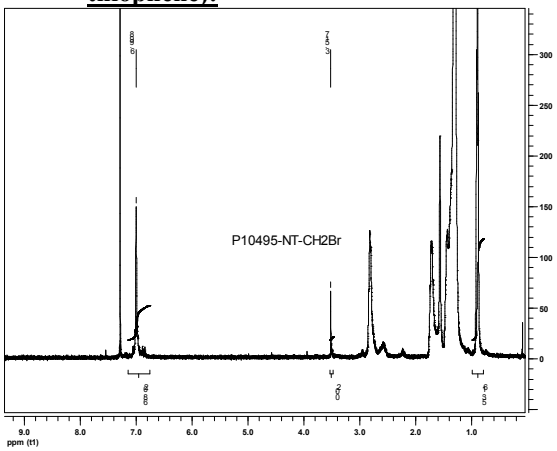
The crude polymer was recovered from fractional precipitation into methanol-Acetone mixture. The inorganic salts were removed by dissolving in Hexane and filtering the solution. The pure polymer was than dissolved in hexane-ChCl3 and precipitated in cold ethanol.

Characterization: The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF or Chloroform. 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. The molecular weight is calculated based on polystyrene standards. The NMR spectrum was recorded in deuterated chloroform to determine the functionality and the composition of copolymer.

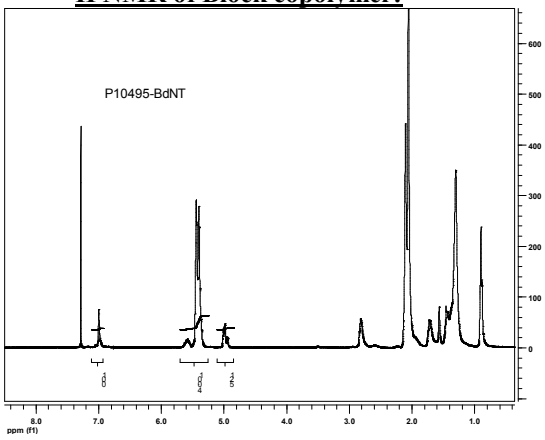
HNMR of the OH terminated Poly(3-nonyl thiophene)



HNMR of the Br terminated Poly(3-nonyl thiophene):

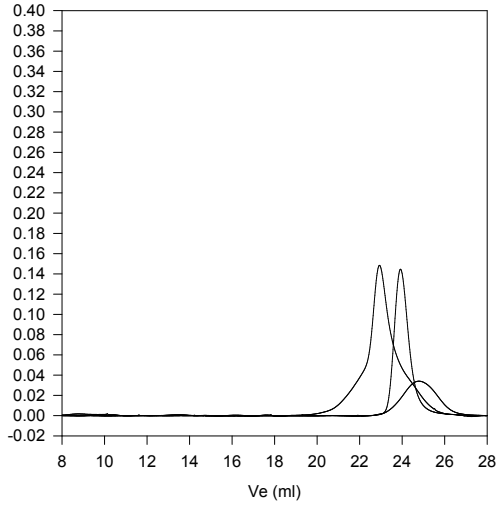


H NMR of Block copolymer:



SEC profile of polymers:

P10495-BdNTH



SEC profile of the polymer:

—— Polybutadiene block, M_n=6000, M_w=6200, PI=1.04

—— Poly Nonyl thiopheneCH2Br terminated , M_n=4500, M_w=5800, PI=1.3

—— Diblock Copolymer PBd(6000)-b-PNTH(4500),PI=1.4