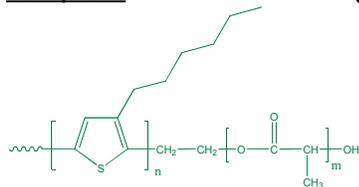


## Sample Name:

**Poly(3-hexyl thiophene-b-lactide[D/L])**

**Sample #: P13188A-3HTLA (D/L-form)**



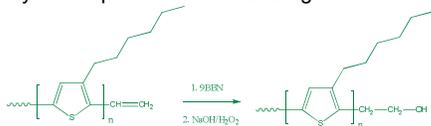
### Composition:

| Mn x 10 <sup>3</sup><br>(3HT-b-LA) | PDI | Regioregularity of<br>P3HT |
|------------------------------------|-----|----------------------------|
| 4.0-8.5                            | 1.8 | ~90% (H-T)                 |

### Synthesis Procedure:

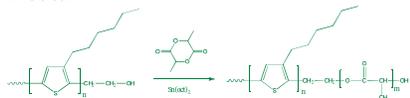
1. Hydroxy terminated poly(3-hexylthiophene):

Hydroxy terminated poly(3-hexylthiophene) was prepared according to the procedure reported in literature, the brief synthetic procedure as following:



2. Block copolymer:

D/L-lactide was polymerized under catalysis of Tin octate with hydroxy terminated poly(3-hexylthiophene) as initiator.



3. Purification of polymer:

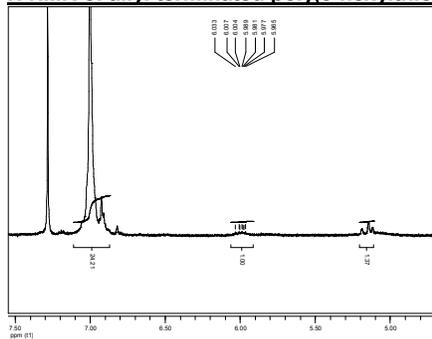
The crude polymer was recovered from reprecipitation into methanol. The inorganic salts were removed by using a Soxhlet extractor with Methanol. The pure polymer was dissolved in chloroform by the same extractor.

**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.

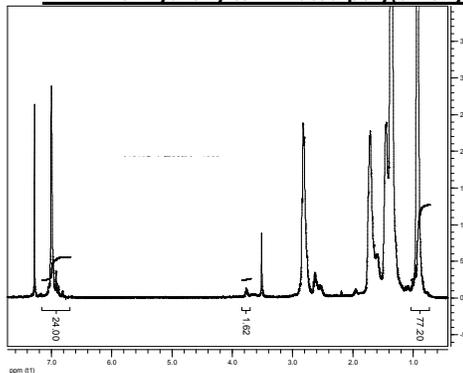
### Solubility:

Poly(3-hexyl thiophene-b-lactide) is soluble in THF, Toluene and CHCl<sub>3</sub>. It precipitates from methanol and hexane.

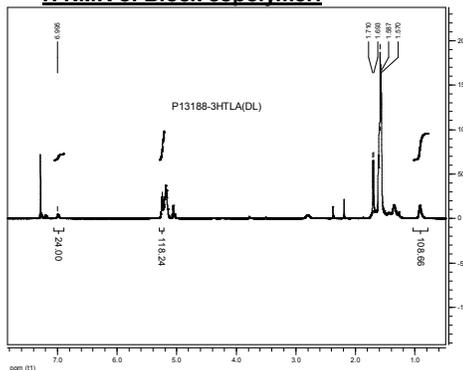
### H NMR of allyl terminated poly(3-hexylthiophene):



### H NMR of hydroxy terminated poly(3-hexylthiophene):

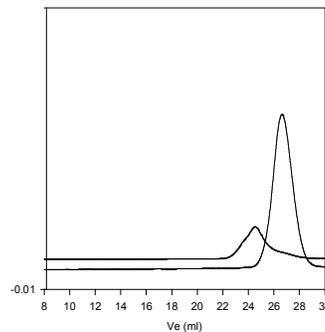


### H NMR of Block copolymer:



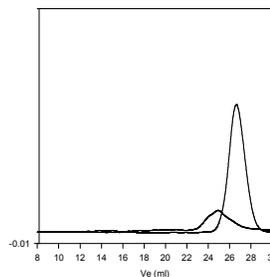
### SEC profile of polymers:

**P13188A-3HTLA (DLform) underf UV at 380nm**



Size exclusion chromatography of poly(3-hexylthiophene-b-lactide):  
— OH terminated poly(3-hexylthiophene), M<sub>n</sub>=4,000, M<sub>w</sub>=4,700, M<sub>w</sub>/M<sub>n</sub>=1.18  
— Block Copolymer M<sub>n</sub>=P3HT(4000)-b-PLA(8500), M<sub>w</sub>/M<sub>n</sub>=1.8

**P13188A-3HTLA (DLform)**



Size exclusion chromatography of poly(3-hexylthiophene-b-lactide):  
— OH terminated poly(3-hexylthiophene), M<sub>n</sub>=4,000, M<sub>w</sub>=4,700, M<sub>w</sub>/M<sub>n</sub>=1.18  
— Block Copolymer M<sub>n</sub>=P3HT(4000)-b-PLA(8500), M<sub>w</sub>/M<sub>n</sub>=1.8