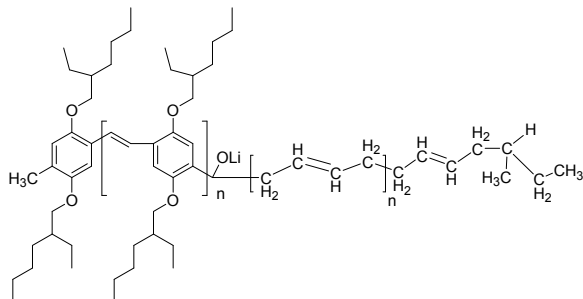


Poly(2,5-di(2'-ethylhexyloxy)-1,4-phenylenevinylene)-b-Bd (1,4 rich addition)

Structure:



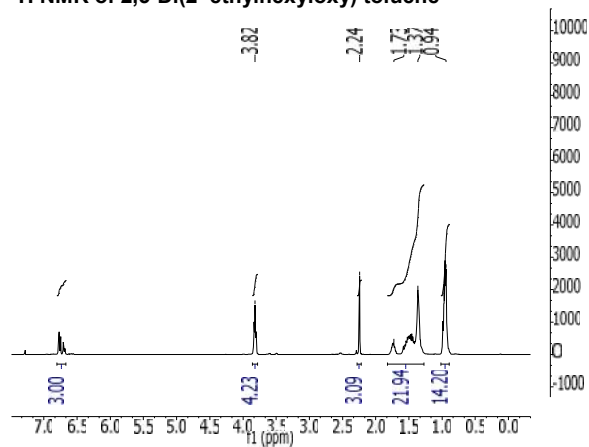
Mn x 10 ³ DEHPPV-b-Bd	PDI
2.0-b-3.5	1.9

1. synthesis DEH-PPV bearing end group of aldehyde:
2. Reaction of Poly butadiene living lithium salt with aldehyde terminated DEH_PPV. Followed by rigorous fractionation to remove any untreated poly butadiene fractions.
3. Aldehyde end group DEH-PPV is synthesized by polymerization of Seigrist polycondensation under basic condition in DMF, followed by hydrolysis in acidic water. The polymer was then dissolved in chloroform and washed with distilled water until neutral, dried over MgSO_4 and precipitated into cold methanol.

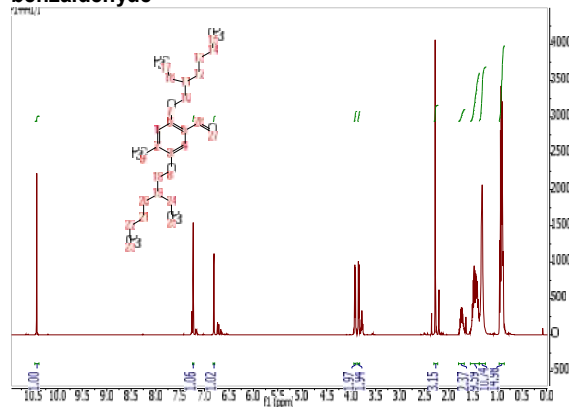
The reaction scheme shows the synthesis of poly(1,3-butadiene) using a lithium carbanion initiator. The initiator is a lithium carbanion of 2-methyl-2-butene, represented as $\text{H}_3\text{C}-\text{C}(\text{H}_2)(\text{H})\text{Li}-\text{CH}_3$. This reacts with 1,3-butadiene ($\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$) in the presence of cyclohexane as a solvent. The reaction proceeds via a living polymerization mechanism, leading to the formation of a lithium-terminated poly(1,3-butadiene) chain. The polymer structure is shown as a repeating unit $[\text{CH}_2-\text{CH}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{CH}=\text{CH}-\text{CH}_2]_n$ with a lithium end group $-\text{OLi}$. The lithium end group is shown in two different orientations, indicating the living nature of the polymer.

The molecular weight was obtained by ^1H NMR by comparing the end aldehyde group at 10.5 ppm to aromatic proton at 7.54 ppm or vinyl proton at 7.26 ppm for the aldehyde end functionalized prepolymer followed by block copolymer.

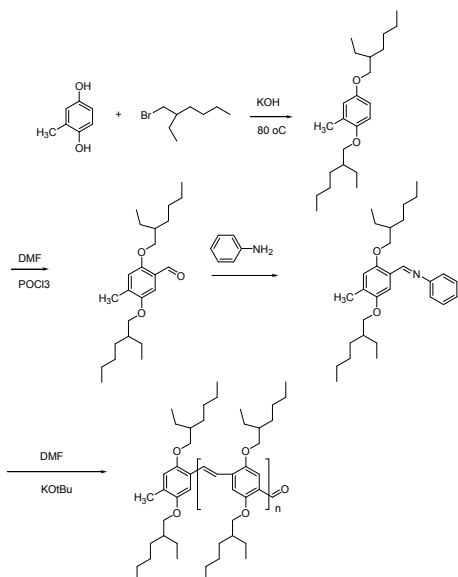
¹H NMR of 2,5-Di(2'-ethylhexyloxy) toluene



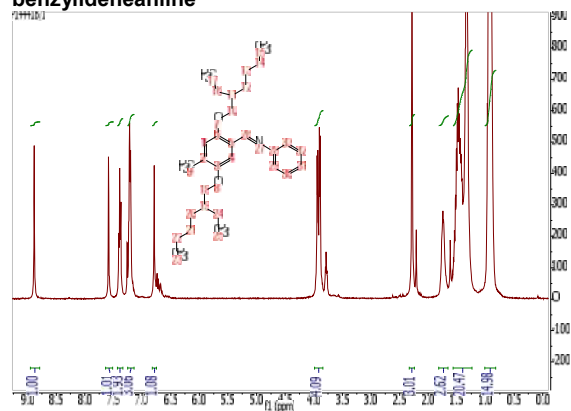
¹H NMR of 2,5-Di(2'-ethylhexyloxy)-4-methylbenzaldehyde



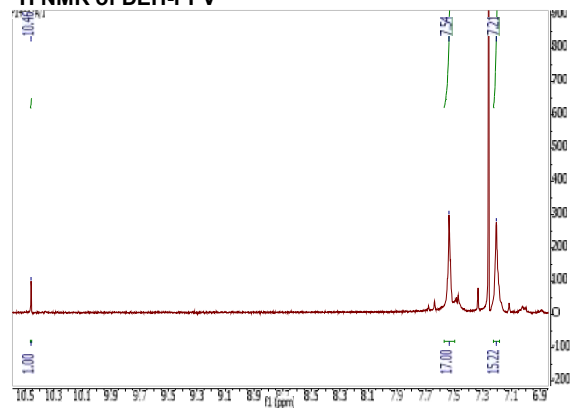
Reaction with Poly butadiene



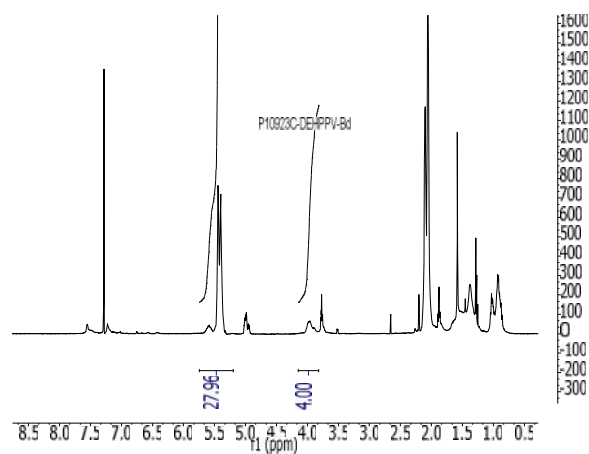
¹H NMR of 2',5'-Di(2"-ethylhexyloxy)-4'-methyl-N-benzylideneaniline



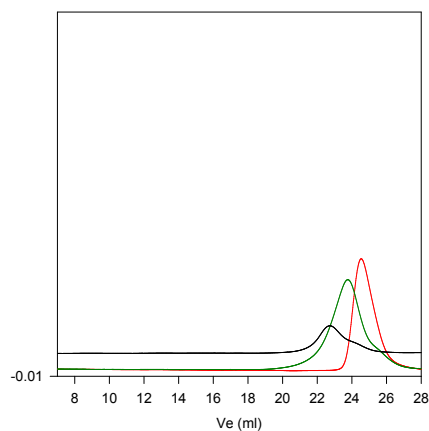
¹H NMR of DEH-PPV



HNMR of the Block copolymer:



P10923C-DEHPPV-Bd



- Size exclusion chromatography of poly(DEHPPV-Bd)
- Poly(2,5-di(2,-ethylhexyloxy)-1,4-phenylenevinylene, $M_n=2000$, $M_w=3000$, $M_w/M_n=1.45$
 - PBd $M_n=3,500$, $M_w/M_n=1.10$
 - After linking reaction DEHPPV-Bd $M_n=DEHPPV(2000)-b-(3,500)$, $M_w/M_n=1.9$