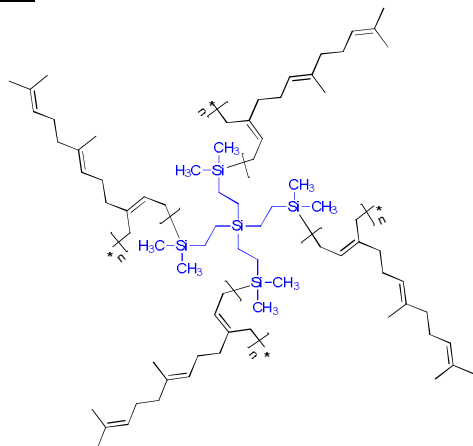


Sample Name:

4-Arm Star 1,4-POLYFARNESENE

Core: *Tetrakis(2-(dimethylsilyl)ethyl)silane*

Sample # **P18393-4-Farne**

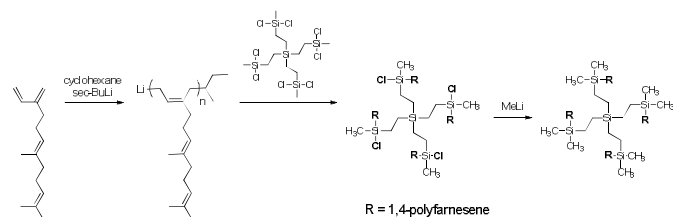


M _n (arm), g/mol	M _n (total), g/mol	M _w /M _n
20.5 × 10 ³	84.5 × 10 ³	1.07

Synthesis and Purification:

1,4-Polyfarnesene (PF) was synthesized by anionic living polymerization of β-farnesene in cyclohexane using sec-BuLi as an initiator; followed by PF coupling with tetrakis(2-[dichloro(methyl)silyl]ethyl)silane.

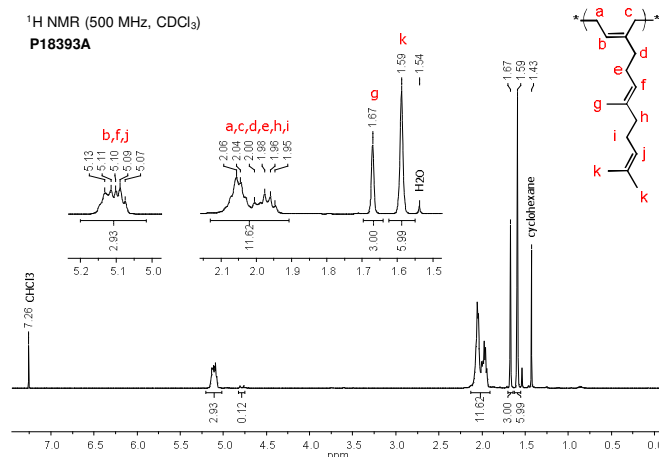
Steric hindrance does not favor complete coupling of octofunctional core with eight chains of 1,4-poly-farnesene, and resulted in formation of random (non symmetric) four-arm star polymer. To deactivate the remaining functional groups, the crude product was dissolved in toluene, and methyl lithium was added to substitute any remaining Cl group to methyl group. The product was fractionated by selective precipitation to remove free 1,4-polyfarnesene.



Characterization:

The absolute molecular weight and polydispersity index (PDI) were determined by size exclusion chromatography (SEC) using light scattering (LS) detector. SEC analysis was performed on a Varian ProStar liquid chromatograph equipped with UV-vis, RI and LS triple detector from Viscotec, three SEC columns from Supelco (G6000-4000-2000 HXL), and using THF as an eluent.

¹H NMR spectrum of polyfarnesene arm.

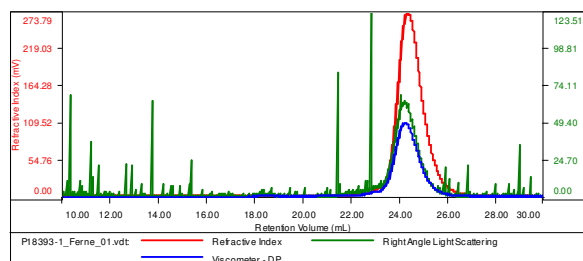


1,4-Polyfarnesene contains ≤6% of 1,2-polyfarnesene.

SEC elugrams: (a) PF arm, (b) star PF.

(a) Sample ID: P18393-Farnesene branch

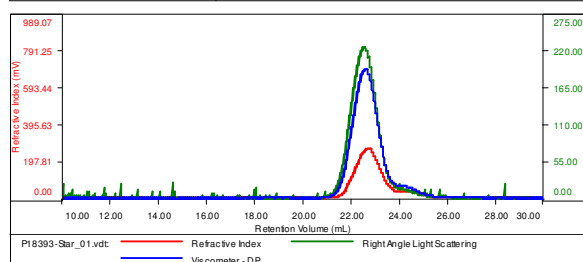
Concentration (mg/mL)	15.3778
Sample dn/dc (mL/g)	0.1250
Method File	PS80K-Jan05-2014-0001.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	M _n	M _w	M _p	M _w /M _n	IV
P18393-1_Ferne_01.vdt	20,541	22,642	22,743	1.102	0.1269

(b) Sample ID: P18393-Farnesene star

Concentration (mg/mL)	15.4491
Sample dn/dc (mL/g)	0.1250
Method File	PS80K-Jan05-2014-0001.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	M _n	M _w	M _p	M _w /M _n	IV
P18393-Star_01.vdt	84,533	90,388	90,793	1.069	0.2336