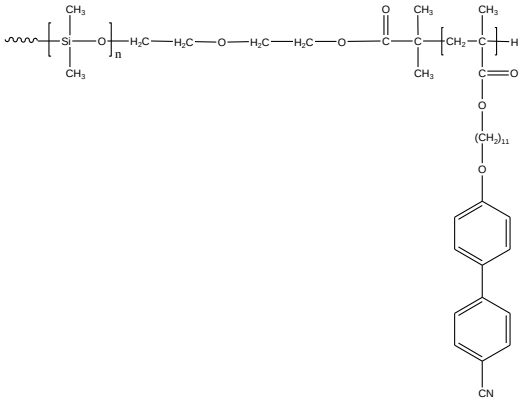
Sample Name: **Poly(dimethylsiloxane-b-11-(4′-cyanobiphenyl-4-yloxy)undecylmethacrylate)**
Sample #: **P9917-DMS4CNBP11CMA**

Structure:



Composition:

Mn x 10^3 DMS-b-4CNBP-11LCMA	Mw/Mn (PDI)
5-b-20	1.3

Synthesis Procedure:

Poly(dimethylsiloxane-b-6-(4′-cyanobiphenyl-4-yloxy) undecylmethacrylate) is prepared by ATR-polymerization of 6-(4′-cyanobiphenyl-4-yloxy)undecylmethacrylate) with bromo-terminated polydimethylsiloxane as macro-initiator.

Characterization:

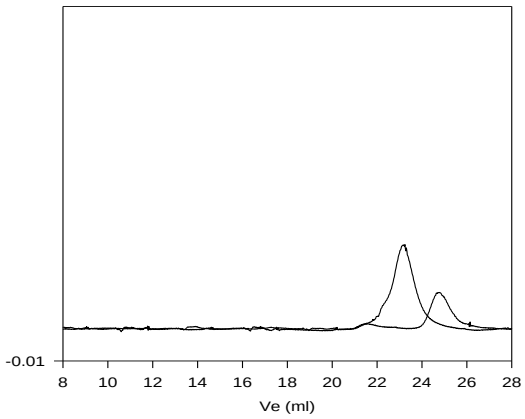
An aliquot of the bromo-terminated poly(dimethyl siloxane) was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the dimethyl siloxane protons near 0 ppm with the 4CNBPHMA protons at about 3.6 ppm. Block copolymer PDI is determined by SEC.

Solubility:

Poly(dimethylsiloxane-b-6-(4′-cyanobiphenyl-4-yloxy) undecylmethacrylate) is soluble in THF, chloroform and toluene. It is precipitated in methanol.

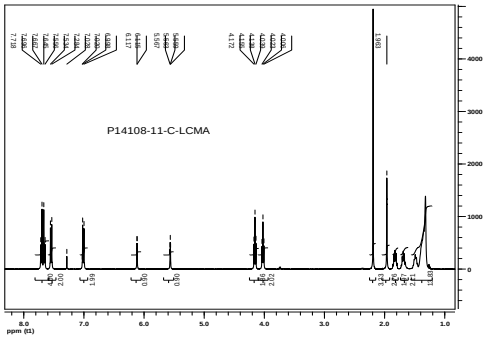
SEC profile of the block copolymer

P9917-DMS4CNBP11CMA

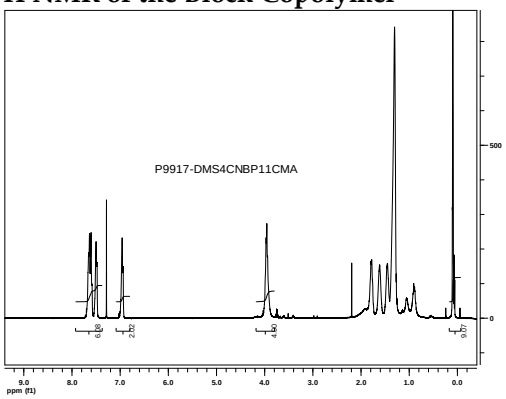


Size exclusion chromatography of the product:
Polydimethylsiloxane, M_n=5000, M_w=5400, PI=1.05
Block Copolymer PDMS(5000)-b-4CNBP11CMA(20,000), PI=1.3

HNMR of the monomer:



H NMR of the Block Copolymer



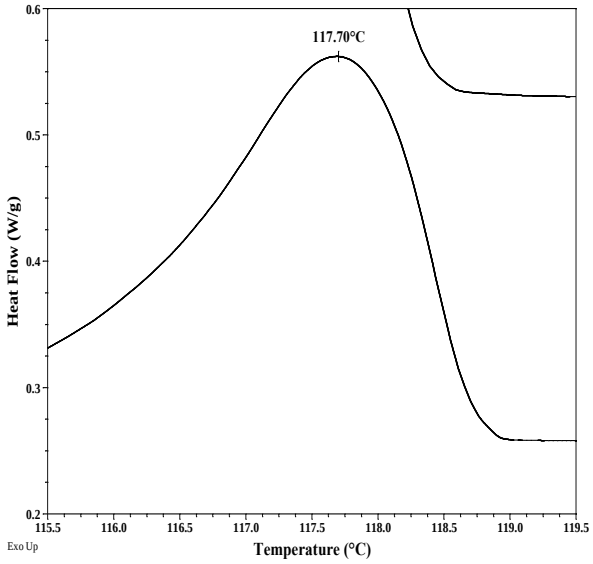
Thermal analysis of the P9917-DMS4CNBP11CMA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10^{o}C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Melting and crystallization curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

Crystallization curve for 4CNBP-11C-MA block:



Thermal analysis results at a glance

Sample	T_m (^{o}C)	T_c (^{o}C)	T_g (^{o}C)
DMS block	Not distinct	Not distinct	-127 (Lit)
4CNBP-11C-MA block	122	118	-

Melting curve for 4CNBP11CMA block: