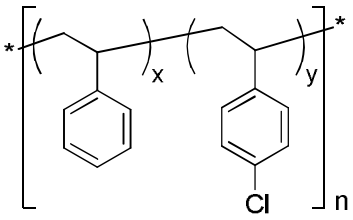
Sample Name: **Poly(styrene-co-4-chlorostyrene) random copolymer**

Sample # **P19641F-S4ClSran**

Structure:



Composition:

M_n x 10^3 (g/mol)	M_w/M_n
21.5	1.10

Content of poly(4-chlorostyrene):	7.5 mol%
T_g of PS-*co*-P4ClS:	104.5 °C

Synthesis procedure:

The copolymer was prepared by radical polymerization of styrene and 4-chlorostyrene in presence of TEMPO.

Characterization:

Molecular weight and polydispersity index (M_w/M_n) of the copolymer were obtained by size exclusion chromatography (SEC). Analysis of the copolymer by ^{1}H NMR spectroscopy did not reveal any presence of monomer impurities. Content of poly(4-chlorostyrene) in PS-*co*-P4ClS copolymer was determined by elemental analysis.

Thermal analysis:

Thermal analysis of the copolymer was performed on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°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).

Solubility:

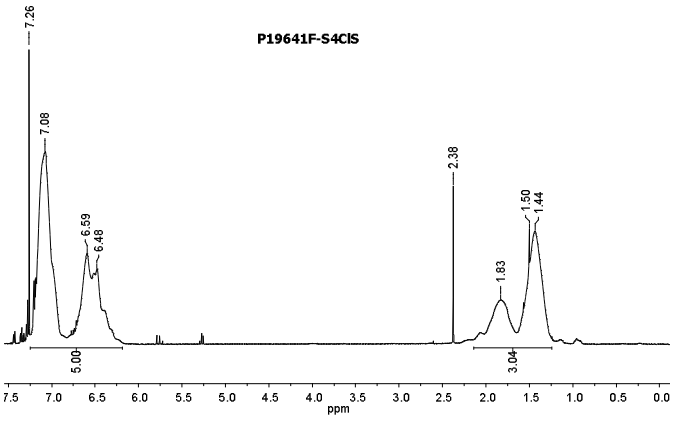
PS-*co*-P4ClS is soluble in $CHCl_3$, THF, DMF, toluene. The copolymer precipitates from hexane.

Elemental analysis of PS-*co*-P4ClS:

Sample: P19641F
Lab ID: 2016-A-9371 **Received:** 2016-01-19

Analysis	Method	Result	Basis	Sample Amount Used
C : Carbon				
	GLI Procedure ME-14	87.19 %	As Received	1.491 mg
Cl : Chlorine				
	GLI Procedure ME-4A	2.51 %	As Received	31.84 mg
H : Hydrogen				
	GLI Procedure ME-14	6.99 %	As Received	1.491 mg

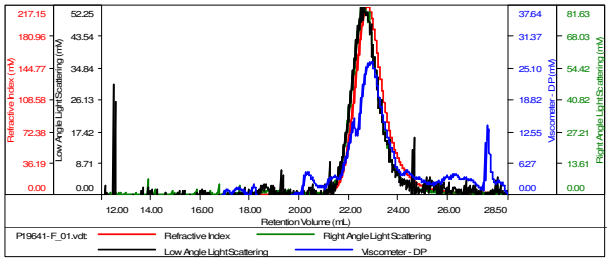
^{1}H-NMR (500 MHz, $CDCl_3$) spectrum:



SEC elugram of the random copolymer:

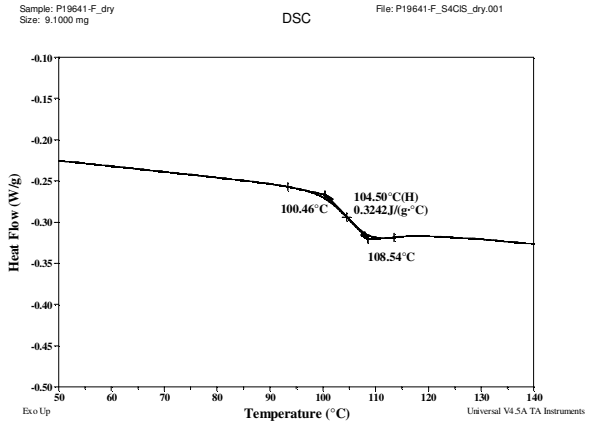
Sample ID-P19641F-S4ClS ran

Concentration (mg/mL)	1.5652
Sample dn/dc (mL/g)	0.1850
Method File	PS80K-June30-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersity	Intrinsic Viscosity (dL/g)
P19641-F_01.vdt	21,330	23,508	23,895	1.102	0.7321

DSC thermogram of PS-*co*-P4ClS:



Reference: Thermal transition of Tg for S4ClSran copolymer (M_n=19.5–22.5 kDa).

4ClS:	7 mol%	8mol%	19 mol%	35 mol%	36 mol%	54 mol%
T_g:	103°C	105°C	107°C	112°C	114°C	123°C