Sample Name: **Poly (methyl methacrylate)**

Different microstructure

Sample #: **P19327A-MMA**

Structure:

$$\sim\!\!\sim\!\!\sim\!\!\left[CH_2\!-\!\underset{\underset{\underset{CH_3}{O}}{\overset{C=O}{|}}}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}}\right]_n\!\!\sim\!\!\sim\!\!\sim$$
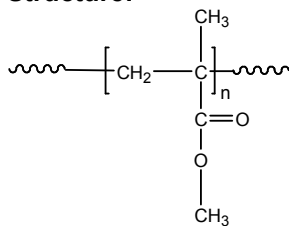
Composition:

Mn x 10^3	PDI
125.0	1.9

Syndio : Hetero : Isotactic	60:35:5

Synthesis Procedure:

Poly (methyl methacrylate) is obtained by free radical polymerization or ATRP using CuBr as catalyst / or GTP process in toluene or in THF.

Characterization:

Tacticity of the polymer was determined by 1H NMR.

The molecular weight and polydispersity index (PDI) were obtained by size exclusion chromatography (SEC) in THF. 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.

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10°C/min. The inflection glass transition temperature (T_g) of the sample has been considered.

Solubility:

The polymer is soluble in THF, $CHCl_3$, toluene and dioxane. The polymer precipitates from cold methanol and ethanol.
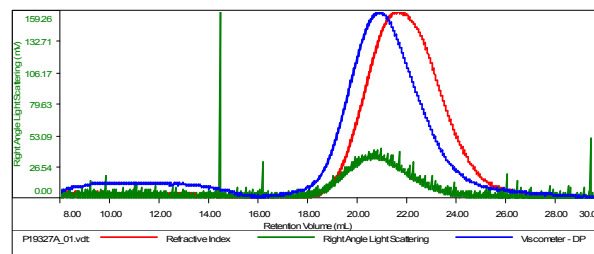
T_g vs MW for selected atactic PMMA:

$M_n \times 10^3$	T_g ($^\circ$C)	$M_n \times 10^3$	T_g ($^\circ$C)
1.1	51	36	98
2.5	76	55	111
5.0	91	70	107
15	101	127	115
19	107	230	114
29	96	700	121

SEC elugram of PMMA homopolymer:

Sample ID:P19327A-MMA

Concentration (mg/mL)	2.6085
Sample dn/dc (mL/g)	0.0840
Method File	PS80K-June26-2015-0001.vcm
Column Set	3x PL 1113-6300
Solvent	THF

Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersi	Intrinsic Viscosity (dL/g)
P19327A_01.vdt	125,026	238,235	193,944	1.905	0.8891

DSC:

Tg of atactic poly methyl methacrylate as function of molecular weight