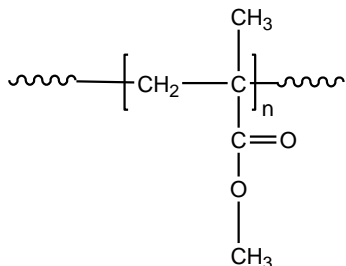


Sample Name: **Poly(methyl methacrylate)**
Isotactic (>70%)

Sample #: **P5450C-MMA**

Structure:



Composition:

| | |
|-----------------------|-------------|
| $M_n \times 10^3$ | PDI |
| 22.5 | 1.5 |
| Syndio : Hetero : Iso | 9 : 20 : 71 |
| T_g | 59°C |

Synthesis Procedure:

Tacticity of the poly(methyl methacrylate) is tailored by anionic polymerization of MMA monomer in different polarity solvents mixture and using different ligands.

Characterization:

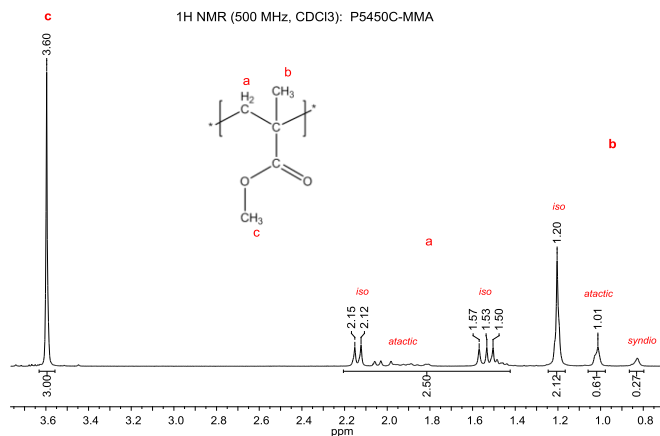
Tacticity of the polymer was determined by ^1H NMR. The molecular weight and polydispersity index (PDI) were obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns 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 $10^\circ\text{C}/\text{min}$. The inflection glass transition temperature (T_g) of the sample has been considered.

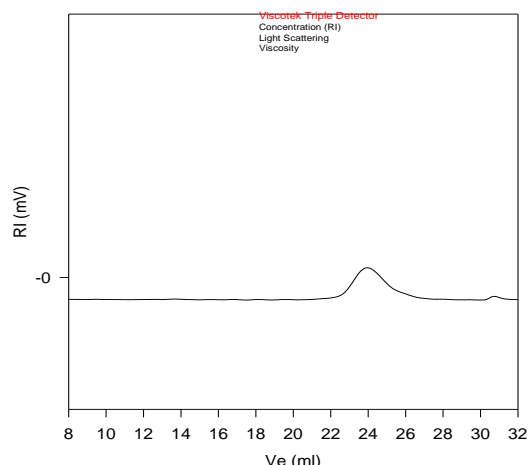
Solubility:

The polymer is soluble in chloroform.

^1H NMR spectrum of PMMA:

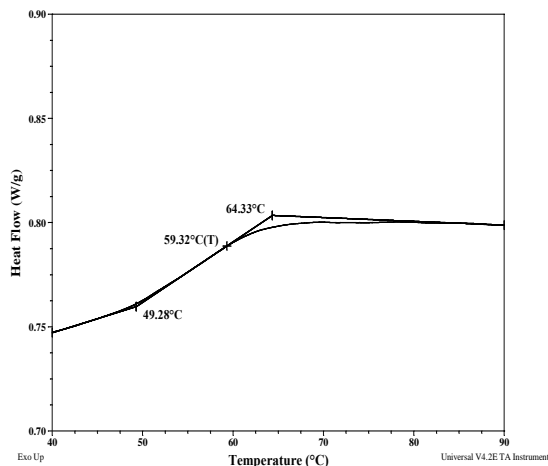


SEC elugram of PMMA homopolymer:
P5450C-MMA



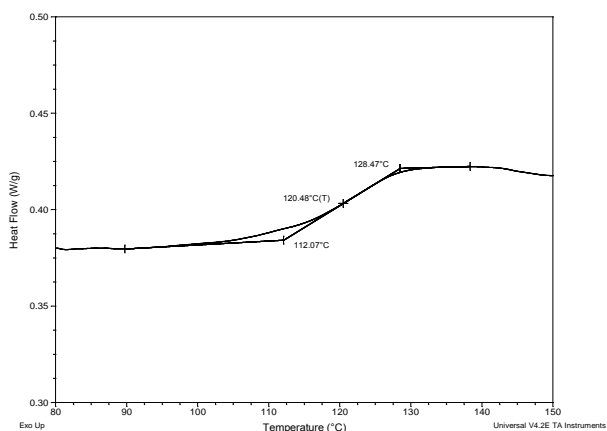
Size Exclusion Chromatography of isotactic poly(methyl methacrylate):
 — $M_n = 22,500$, $M_w = 33,500$, $M_w/M_n = 1.5$

DSC thermogram of the polymer P5450C-MMA:

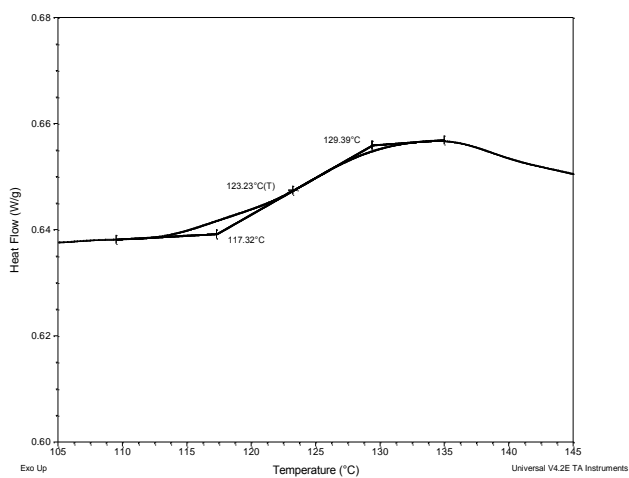


Thermograms of PMMA:

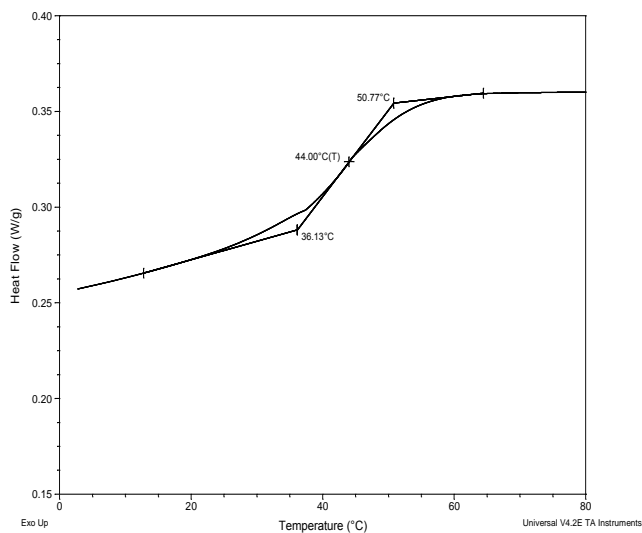
(a) syndiotactic >79%



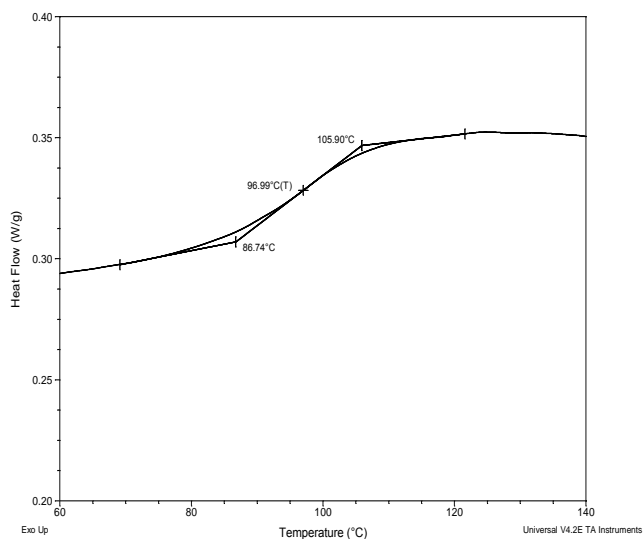
(b) syndiotactic >85%



(c) isotactic >97%



(d) atactic



**Summary of DSC results for PMMA
of different tacticity:**

| <i>PMMA microstructure</i> | <i>Tacticity Syndio : Iso : Hetero</i> | <i>T_g (°C)</i> |
|--------------------------------|--|-------------------------------|
| Syndiotactic >79% | 79 : 19 : 2 | 120 |
| Syndiotactic >85% | 86 : 0 : 14 | 123 |
| Isotactic >97% | 0 : 97 : 3 | 44 |
| Atactic | 56 : 6 : 38 | 97 |