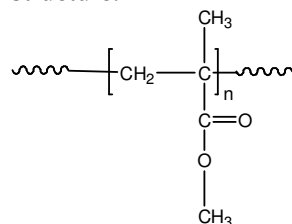


**Sample Name: Poly(methyl methacrylate)**  
*Isotactic Form*

**Sample #: P4550-iMMA**  
**(iso contents over 98%)**

**Structure:**



**Composition:**

$M_n \times 10^3$	PDI
170.0	1.6

**Synthesis Procedure:**

Isotactic Poly(methyl methacrylate) is obtained by living anionic polymerization in toluene using a Grignard initiator such as t-butylmagnesium bromide.

**Characterization:**

The molecular weight and polydispersity index (PDI) are 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 Viscocok Co.  $^1\text{H}$  NMR analysis was carried out on Varian instrument at 500MHz.

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.

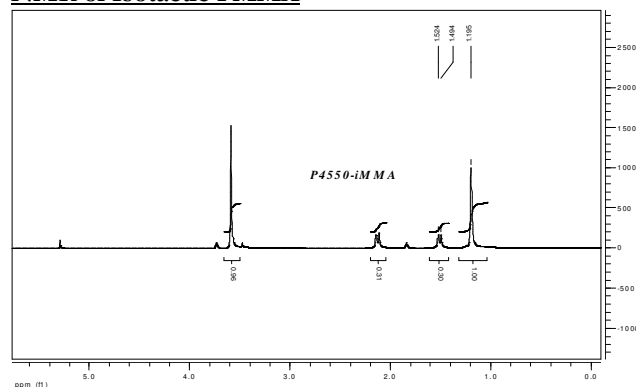
**Solubility:**

Poly(methyl methacrylate) is soluble in THF,  $\text{CHCl}_3$ , toluene and dioxane. The polymer precipitates from hexanes, methanol and ethanol.

**$T_g$  vs MW for selected isotactic PMMA**

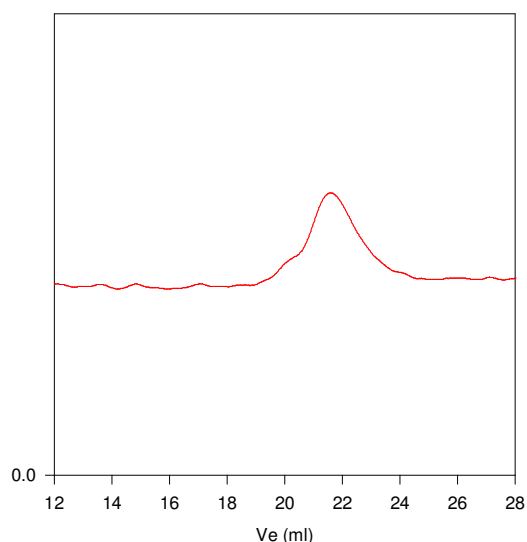
$M_n \times 10^3$	$T_g$ ( $^\circ\text{C}$ )	$M_n \times 10^3$	$T_g$ ( $^\circ\text{C}$ )
3.4	31	40	51
6.3	52	93	53
10	48	170	57
15	52	332	55
30	46	769	51

**NMR of Isotactic PMMA**



**SEC of the Homopolymer:**

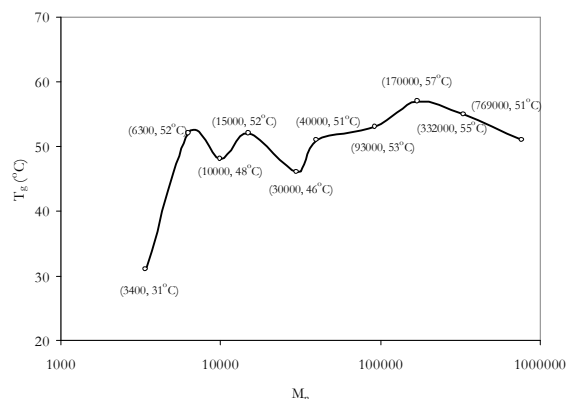
**P4550-iMMA**



Size exclusion chromatography of isotactic poly(methyl methacrylate):

$M_n=170,000$ ,  $M_w=272,000$   $M_w/M_n=1.6$   
 iso contents > 98%

**$T_g$  of isotactic MMA as function of molecular weight**



**References for further information:**

S. K. Varshney, R. Fayt, Ph. Teyssie, US Patent 5,629,393, 1997