

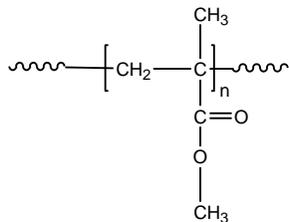
Sample Name: Poly(methyl methacrylate)

Isotactic Form

Sample #: P4164-iMMA

(iso contents over 92%)

Structure:



Composition:

M _n x 10 ³	PDI
15.0	1.25

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 Viscoek Co. ¹H 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°C/min. The inflection glass transition temperature (T_g) of the sample has been considered.

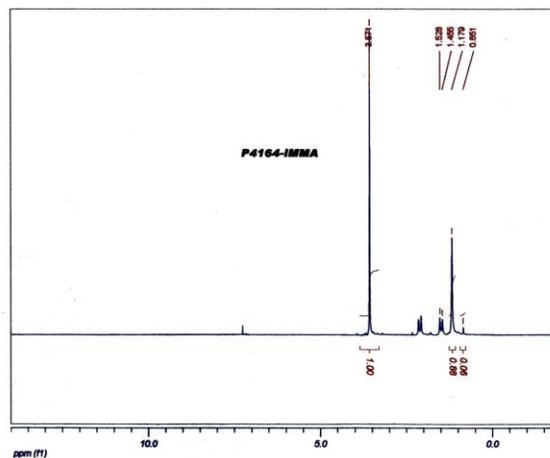
Solubility:

Poly(methyl methacrylate) is soluble in THF, CHCl₃, toluene and dioxane. The polymer precipitates from hexanes, methanol and ethanol.

T_g vs MW for selected isotactic PMMA

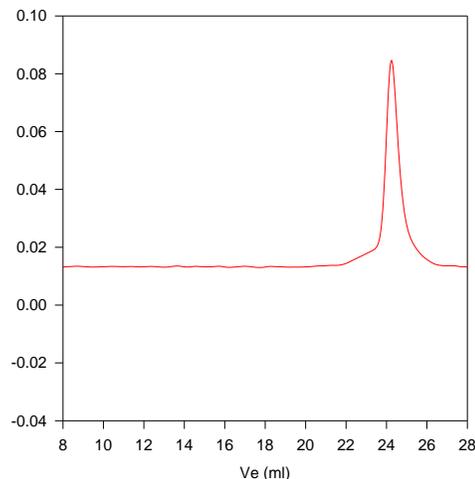
M _n × 10 ³	T _g (°C)	M _n × 10 ³	T _g (°C)
3.4	31	40	51
6.3	52	93	53
10	48	170	57
15	52	332	55
30	46	769	51

NMR of Isotactic PMMA



SEC of the Homopolymer:

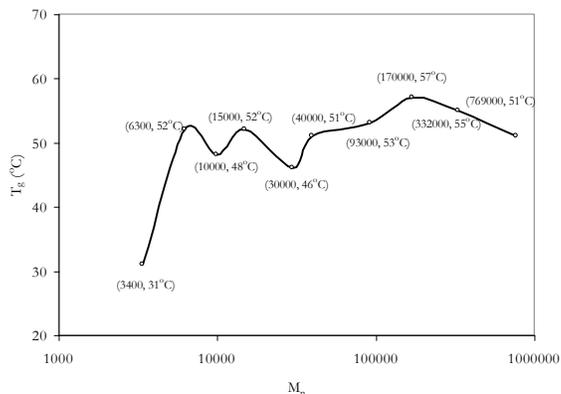
P4164-iMMA



Size exclusion chromatography of poly(methyl methacrylate)

— M_n=15000, M_w=18500 PI=1.25
iso contents > 92%
solution viscosity in THF at 30 °C: 0.160dl/g

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