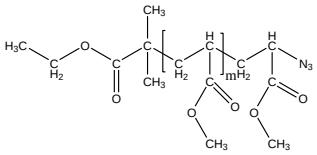
Sample Name: **α-azido end functionalized Poly (methyl acrylate)**

Sample #: **P41623-MA-N3**

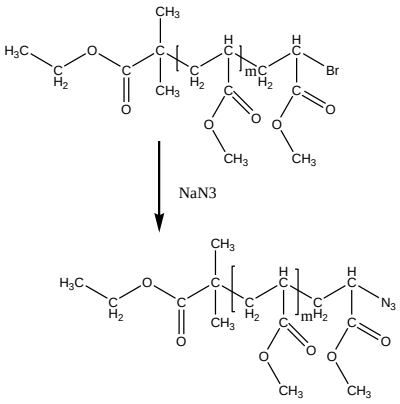
**Structure:**



**Composition:**

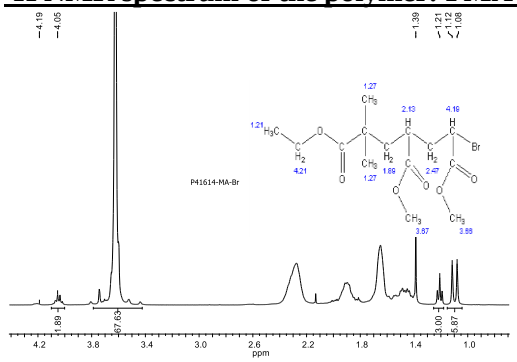
| Mn x $10^3$ | PDI |
|---|---|
| 1.0 | 1.12 |

**Synthesis Procedure:**
The Br end functionalized PMA was prepared by ATRP polymerization process followed by reaction Br end PMA with NaN3 in DMF.
The following reaction scheme shows how the product was prepared:

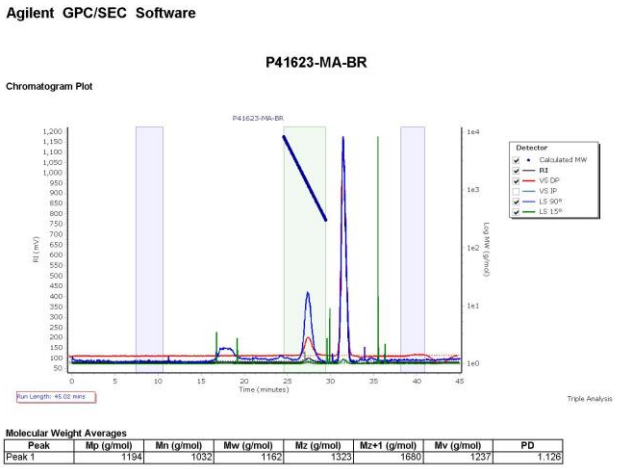



**Characterization:**
The product was characterized by size exclusion chromatography (SEC), $^1$H NMR and FTIR.

**$^1$H NMR spectrum of the polymer: PMA-Br**



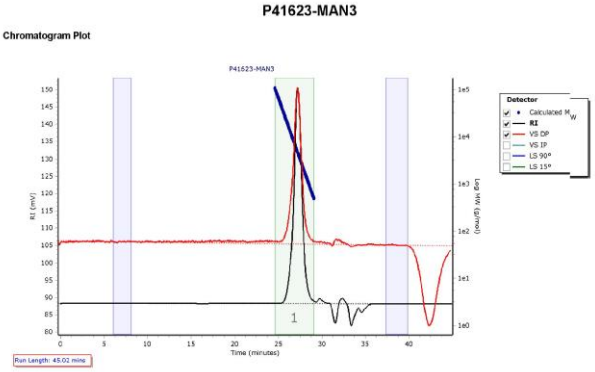

**SEC elugram of the PMA-Br:**




Molecular Weight Averages

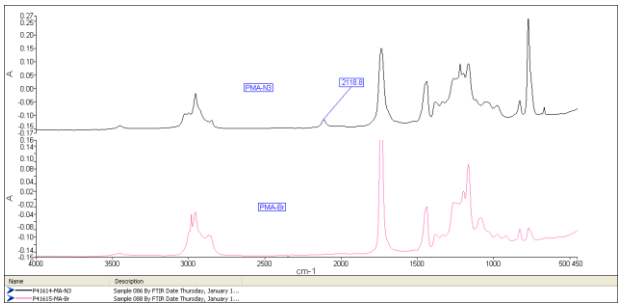
| Peak | Mp (g/mol) | Mn (g/mol) | Mw (g/mol) | Mz (g/mol) | Mz+1 (g/mol) | Mv (g/mol) | PD |
|---|---|---|---|---|---|---|---|
| Peak 1 | 1194 | 1032 | 1162 | 1323 | 1680 | 1237 | 1.126 |

**After converting Br to N3 end group the elution count of the obtain polymer in their SEC changes to lower elution count;**




| Peak | Mp (g/mol) | Mn (g/mol) | Mw (g/mol) | Mz (g/mol) | Mz+1 (g/mol) | Mv (g/mol) | PD |
|---|---|---|---|---|---|---|---|
| Peak 1 | 4574 | 3728 | 5547 | 8854 | 17660 | 7209 | 1.488 |

**FTIR spectra of the PMA-Br and PMAn3**




**FTIR Spectra:**
Presence of Azide end groups were observed by FTIR (Cm-1): 2118(s) and compare with Carbonyl 1735 (s).

**Calibration for FTIR:**

Methyl 2- azidopropionate and Bromo end functionalized poly methyl acrylate were mixed in several ration in CHCl3 and FTIR were made in CHCl3 in a solution cell. The integration of the peak corresponding to the azide and carbonyl groups were compared. It gives you an approximate functionalization. The details are reported in our publication : Xing Fu. Zhong, S. K.Varshney, and A. Eisenberg

"Critical Micellization Length for Polystyrene-b-Na-Acrylate Block Ionomers" CA Vol 117, 26, 252280 Macromolecules 1992, 25, 7160-7167.