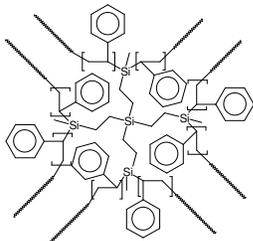


Sample Name: **Eight arm Poly styrene**

Sample #: **P322-8S**

**Structure:**

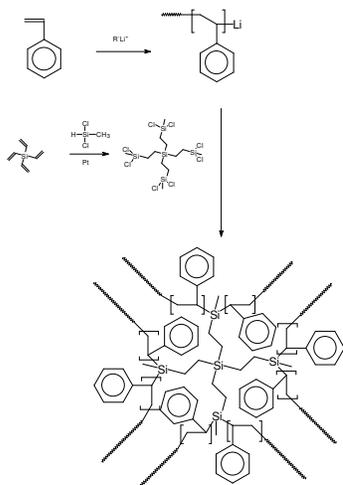


**Composition:**

Mn x 10 <sup>3</sup> (total):	<b>273.0</b>
Mn x 10 <sup>3</sup> (of each arm):	<b>34.6</b>
PDI:	<b>1.02</b>

**Synthesis Procedure:**

The arm-polymer was prepared by anionic living polymerization of styrene in non-polar solvent, and then the star polymer was obtained by coupling reaction with octachlorosilane derivative. The scheme of the reaction is illustrated as Scheme 1.



Scheme 1.

**Synthesis of linking agent:**

The linking agent was synthesized by reacting under nitrogen tetravinylsilane with an excess of dichloromethylsilane. The tetravinylsilane was added dropwise to the catalyst-chlorosilane solution which was maintained at 40°C. The catalyst consisted of 1g of H<sub>2</sub>PtCl<sub>6</sub>•6H<sub>2</sub>O in 9 ml of dimethoxyethane and 1 ml of ethanol. At the end of the reaction, the excess

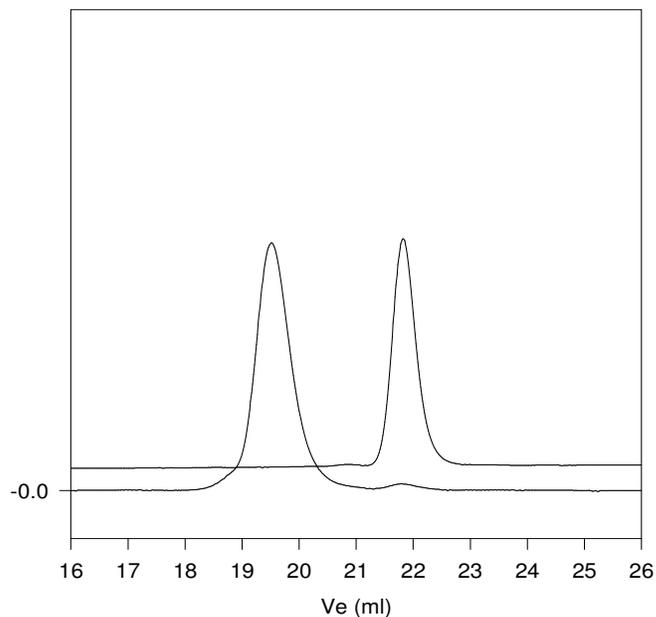
chlorosilane was removed at 60°C under reduced pressure. Distillation under reduced nitrogen pressure was then carried out to collect the linking agent, octafunctional chlorosilane. It was dissolved in purified cyclohexane, divided into several break-seal ampoules, and sealed under vacuum.

**Characterization:**

Molecular weight was characterized by size exclusion chromatography (SEC): Varian liquid chromatograph equipped with UV and refractive detector. SEC columns from Supelco were used with THF as the eluent. The columns were calibrated with monodisperse polystyrene. The molecular weights and the polydispersity indices of the side-arm were calculated. The absolute molecular weight of the star-like polymer was determined by light scattering detector.

**SEC elugram of the Polymer:**

**P322-8S**



**Size exclusion chromatography:**

- Polystyrene before linkage, M<sub>n</sub>=34,600, M<sub>w</sub>=35,600, PI=1.03
- 8-arm polystyrene, M<sub>w</sub> (from light scattering)=273,000