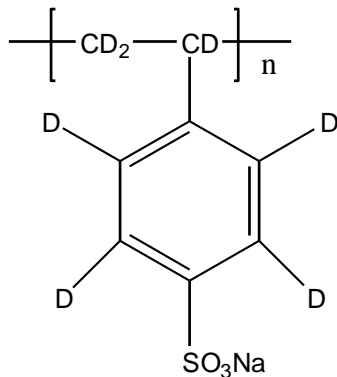


**Sample Name:**

**Deuterated Poly (styrene sulfonic acid sodium salt) dialysed form**

**Sample #: P9770-dPSSO3Na**

**Structure:**

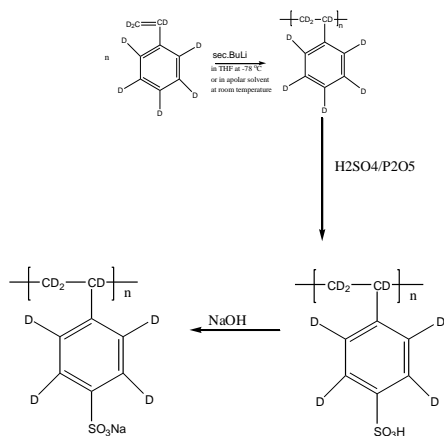


**Composition:**

Mn x 10 <sup>3</sup>	PDI
59.0	1.05
C:H:S By elemental analysis	43:13.11
Degree of sulfonation	>97%

**Synthesis Procedure:**

Deuterated polystyrene-d<sub>8</sub> is obtained by living anionic polymerization of styrene-d<sub>8</sub>. The obtained polymer was sulfonated in the presence of H<sub>2</sub>SO<sub>4</sub>/P<sub>2</sub>O<sub>5</sub>. The polymerization scheme and the sulfonation can be illustrated as below.



**Characterization:**

Size exclusion chromatography (SEC) was carried out on a Varian liquid chromatograph equipped with a refractive detector. For the precursor polystyrene, two columns from Supelco (G4000-2000 HXL) were used with THF as the eluent. The columns were calibrated with monodisperse polystyrene standards. The molecular weight and the polydispersity index were calculated. For polystyrene sulfonic acid, a column from Supelco (G5000 PWXL) was used with 0.1 NaNO<sub>3</sub> /water as the eluent.

The degree of sulfonation was determined by acid/base titration and by elemental analysis.

**Solubility:**

Deuterated polystyrene-(d<sub>7</sub>)sulfonic acid is soluble in water, methanol and ethanol. It precipitates from hexane, toluene, THF.

**Dialysis of the Polymer:**

Dialysis was carried out in a membrane (from spectrum Co). The solution was prepared in H<sub>2</sub>O (distilled Millipore) and filtered after the dialysis is completed. Normally it was carried out for 3 days. The obtained polymer was freeze dried in water.

**SEC of Homopolymer: (starting polystyrene)**

