CHAPTER III

SAMPLE PREPARATION

3.1 Introduction

The optical clarification of the scattering sample is very important in obtaining reliable results in light scattering. The clarification should remove extraneous particles ('dust'), gas bubbles, and any other scattering source are not intrinsic to the sample of interest. Most of the samples prepared in the final stage of clarification, have very low amounts of dust. All glassware and sample cells must be cleaned before used or being filled with the solution. This chapter will discuss the sample preparation and cleaning process for glassware.

3.2 Cleaning Process

Before sample preparation, the glassware and sample cell must be cleaned with care to remove dust and contaminants. The processes are as follows.

3.2.1 Soak new glassware and sample cells in a solution of alcohol and hydrochloric acid at ratio of 1:3. They must be soaked for 4 hours to remove lipid and old solution from the glass surface.

3.2.2 Clean the acid solution from glassware and sample cell by using distilled water until the acid is completely removed.

3.2.3 Use an ultrasonic bath to remove dust from sample cells and glassware for 2 hours.

3.2.4 Rinse with acetone (commercial grade).

3.2.5 Rinse again with filtered analar acetone.

3.2.6 Rinse with filtered distilled water at least 10 times.

3.2.7 Dry the glassware and sample cells in an oven.

3.2.8 Wrap with clean aluminum foil before packing in a plastic box.

3.3 Sample Preparation.

The samples used in this experiment use a solution of polystyrene in cyclohexane. The polystyrene sample was from the Pressure Chemical Company of two weight-average molecular weights; 100000 and 600000 with their M_w/M_N ratio 1.06 and 1.10 respectively. The samples were

made up to 7 different compositions and the concentration of each sample is shown in table 3.1

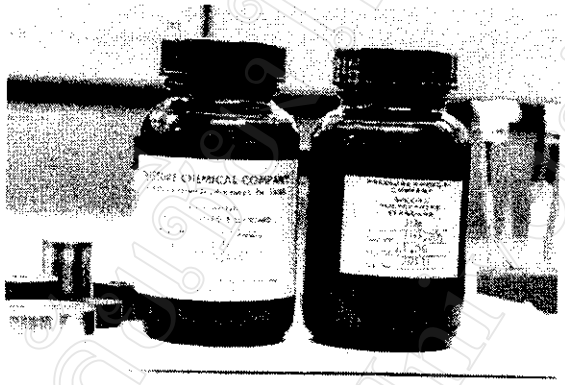

Figure 3.1 Standard polystyrene M=600000 and M=100000, from Pressure Chemical Company

Sample no.	Mass of polystyrene (mg)		Volume of cyclohexane (ml)	Concentration (mg/ml)
	M=100000	M = 600000		
1	250.0	-	25	10
2	-	50.0	25	2.0
3	125.0	25.0	25	6.0
4	87.5	32.5	25	4.8
5	162.5	17.5	25	7.2
6	37.5	42.5	25	2.2
7	212.5	7.5	25	8.8

Table 3.1 The fraction of polystyrene M = 100000 and M = 600000 in the cyclohexane with various concentration.

Mass of polystyrene sample was measured by electronic balance with the accuracy ±0.01 mg. The volume of cyclohexane was measured by a micropipette with accuracy ±0.01 ml. The mixtures were stirred by magnetic stirrer for at least 24 hours at room temperature. The acrodisc filter was used to remove dust and extraneous particles prior to filling the sample cell and leaving for at least 12 hours to allow any air bubbles from the filtering process to disappear. The top cover of the sample cell should be closed firmly to avoid the evaporation of liquid. The surface of the sample cell must be clean before being put into the temperature control chamber because fingerprints or dust will affect the scattering process.