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Experiment-Based Risk Assessment Form

Name of Department	Chemistry	Location of Lab	S7-04
Name of Laboratory	Advanced Teaching Lab	Name of PI	Dr Fung Fun Man
Name of LO	Leng Zhi Jin, Wong Ling Rong	Name of Activity/Experiment	GIST: Determination of the Molecular Weight of a High Polymer

Hazard Identification				Risk Evaluation and Controls						
No	Description/Details of Steps in Activity	Hazards	Possible Accident / Ill Health & Persons-at-Risk	Existing Risk Control (Mitigation)	Severity	Likelihood (Probability)	Risk Level	Additional Risk Control	Person Responsible	By (Date)
1	Introduce 10.0ml of toluene directly from the pipette into the viscometer.	Chemical hazards: Toluene is an irritant to skin and eyes.	1. Exposure to hazardous chemicals. Irritation and burns if in contact with skin and eyes. 2. May be fatal if swallowed. 3. Harmful if inhaled.	1. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 2. Wash skin thoroughly after the experiment. 3. Perform reaction in a well-ventilated fumehood.	1	2	2			
		Fire hazard: Toluene and its vapour are flammable.	Explosion or catching of fire when toluene is exposed to heat.	1. Perform reaction in a well-ventilated fumehood. 2. Keep away from ignition source.	2	1	2			
		Human factor: Spillage of chemicals and breakage of glassware, viscometer, pipette.	1. Irritation if in contact with skin. 2. Skin cuts and exposure to hazardous chemicals from broken glassware.	1. Perform reaction in a well-ventilated fumehood. 2. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 3. Check glassware for cracks prior to use. 4. Read the lab manual on the technical knowhow, how to set up the viscometer apparatus properly.	2	1	2			

2	Place a finger over tube B (See attached diagram at the end of this form), using a pipette filler, apply suction to tube A until the liquid level rises above bulb C, remove the finger from tube B.	<p>Chemical hazards: Toluene is an irritant to skin and eyes.</p>	<p>1. Exposure to hazardous chemicals. Irritation and burns if in contact with skin and eyes. 2. May be fatal if swallowed. 3. Harmful if inhaled.</p>	<p>1. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 2. Wash skin thoroughly after the experiment. 3. Perform reaction in a well-ventilated fumehood.</p>	1	2	2		
	Fire hazard: Toluene and its vapour are flammable.	Explosion or catching of fire when toluene is exposed to heat.	<p>1. Perform reaction in a well-ventilated fumehood. 2. Keep away from ignition source.</p>	2	1	2			
	Human factor: Lack of skill / concentration / did not pay attention to the technique handling of glassware in the experiment	<p>1. Irritation if in contact with skin. 2. Skin cuts and exposure to hazardous chemicals from broken glassware.</p>	<p>1. Perform reaction in a well-ventilated fumehood. 2. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 3. Check glassware for cracks prior to use. 4. Read the lab manual on the technical knowhow, how to conduct this step properly.</p>	2	1	2			

Cannon-Ubbelohde Dilution Type for Transparent Liquids

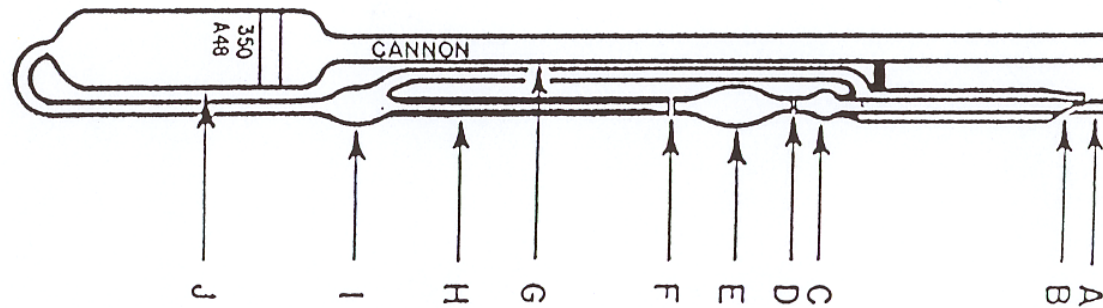


Diagram of Viscometer and its labelled parts

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3	Introduce 10.0ml of the filtered styrene polymer solution (0.5g/25ml) into the viscometer.	Chemical hazards: Styrene and toluene are irritant to skin and eyes.	1. Exposure to hazardous chemicals (styrene and toluene). Irritation and burns if in contact with skin and eyes. 2. Harmful if swallowed (toluene). 3. Harmful if inhaled (toluene).	1. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 2. Wash skin thoroughly after the experiment. 3. Perform reaction in a well-ventilated fumehood.	1	2	2		
		Fire hazard: 1. Styrene and toluene and its vapour are flammable in air. 2. Styrene polymer sample is highly reactive to oxidizing agents.	1. Explosion or catching of fire when styrene and toluene are exposed to heat. 2. Styrene polymer could ignite and cause skins burns.	1. Perform reaction in a well-ventilated fumehood. 2. Ensure no oxidizing agents are in the same fumehood at all times. 3. Keep away from ignition source.	2	1	2		
		Human factor: Lack of skill / concentration / did not pay attention to the technique handling of glassware in the experiment	1. Irritation if in contact with skin. 2. Skin cuts and exposure to hazardous chemicals from broken glassware.	1. Perform reaction in a well-ventilated fumehood. 2. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 3. Check glassware for cracks prior to use. 4. Read the lab manual on the technical knowhow, how to use the viscometer correctly.	2	1	2		

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4	Pipette another 10.0ml of the styrene polymer solution into a preweighed aluminium pan.	Chemical hazards: Styrene is an irritant to skin and eyes.	1. Exposure to hazardous chemicals (styrene polymer solution). Irritation and burns if in contact with skin and eyes. 2. May be fatal if swallowed (styrene polymer solution).	1. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 2. Wash skin thoroughly after the experiment. 3. Perform reaction in a well-ventilated fumehood.	1	2	2			
		Fire hazard: 1. Styrene polymer solution and its vapour are flammable in air. 2. Styrene polymer solution is highly reactive to oxidizing agents.	1. Explosion or catching of fire when styrene polymer solution is exposed to heat. 2. Styrene polymer solution could ignite and explode, causing skins burns.	1. Perform reaction in a well-ventilated fumehood. 2. Ensure no oxidizing agents are in the same fumehood at all times. 3. Keep away from ignition source.	2	1	2			
		Human factor: Spillage of chemicals and breakage of glassware, viscometer, pipette.	1. Irritation if in contact with skin. 2. Skin cuts and exposure to hazardous chemicals from broken glassware.	1. Perform reaction in a well-ventilated fumehood. 2. Ensure PPE (safety glasses, nitrile gloves, lab coat, covered shoes) are worn at all times. 3. Check glassware for cracks prior to use.	2	1	2			


**Conducted By**

Name \_\_\_\_\_ Fung Fun Man \_\_\_\_\_

Signature \_\_\_\_\_

date \_\_\_\_\_ 14-Jun-22 \_\_\_\_\_

**Approved By**

Name A/P Yeo Boon Siang \_\_\_\_\_  \_\_\_\_\_

Signature \_\_\_\_\_

Approval date \_\_\_\_\_ 14-Jun-22 \_\_\_\_\_

Next Revision date  
(Maximum 3 years)

13-Jun-25