

NATIONAL UNIVERSITY OF SINGAPORE
FACULTY OF SCIENCE

Experiment-Based Risk Assessment Form

Name of Department	Chemistry	Location of Lab	S8-04
Name of Laboratory	Analytical Chemistry Teaching Lab	Name of PI (lecturer-in-charge)	Thyagarajan Saradha / Jeremiah Chen
Name of LO	Ong Bee Hoon April / Ng Voon Kunn, Livonne	Name of Activity/Experiment	CM2143: Gas Chromatography (GC) for Qualitative and Quantitative Analysis

Hazard Identification				Risk Evaluation & Control						
No	Description / Details of Steps in Activity	Hazard(s)	Possible Accident(s) or ill Health, and Persons-at-Risk	Existing Risk Control (Mitigation)	Severity	Likelihood (probability)	Risk Level	Additional Risk Control	Person Responsible	By (Date)
1	Inject ethylbenzene into GC with glass syringe.	1) Breakage of glass syringe or accidental contact with sharp end of the GC syringe. (Note: The open end of the syringe is not needle sharp but there is still a risk of being pricked.)	Injury / cuts from broken glass or being pricked by the open end of the syringe.	- Visual inspection of glassware before use to ensure that there are no cracks. - Only handle / hold the syringe by its stem and avoid contact with the tip. - Do not use bare hands to pick up any broken pieces. Ensure proper disposal into the designated broken glass container / box.	1	1	1			
		2) Chemical contact from accidental spillage. i) Ethylbenzene: Eye and respiratory irritant	- May cause skin irritation or eye injury upon contact. - May be harmful if ingested.	- Proper PPE (gloves, goggles, lab coat) to be worn. - No eating or drinking in the lab. - Minimise the amounts of chemicals used (~20 to 40 µL per injection).	1	1	1			
2	Inject samples A, B, C and D into GC with glass syringe.	1) Breakage of glass syringe or accidental contact with sharp end of the GC syringe. (Note: The open end of the syringe is not needle sharp but there is still a risk of being pricked.)	Injury / cuts from broken glass or being pricked by the open end of the syringe.	- Visual inspection of glassware before use to ensure that there are no cracks. - Only handle / hold the syringe by its stem and avoid contact with the tip. - Do not use bare hands to pick up any broken pieces. Ensure proper disposal into the designated broken glass container / box.	1	1	1			
		2) Chemical contact from accidental spillage. Sample A: toluene and ethylbenzene - eye irritant, respiratory irritant, Sample B: cyclohexane, n-propanol and o-xylene - extreme eye irritant, respiratory irritant, Sample C: ethanol, n-propanol, n-butanol and n-pentanol - extreme eye irritant, respiratory irritant, Sample D: Mixture of A, B and C.	- May cause skin irritation or eye injury upon contact. - May be harmful if ingested.	- Proper PPE (gloves, goggles, lab coat) to be worn. - No eating or drinking in the lab. - Minimise the amounts of chemicals used (~20 to 40 µL per injection).	1	1	1			

Conducted By


Name Thyagarajan Saradha / Jeremiah Chen

Approved By

Name Assoc Prof Yeo Boon Siang, Jason

NATIONAL UNIVERSITY OF SINGAPORE
FACULTY OF SCIENCE

Signature  
Date 22/7/2022

Signature 
Approval date 22/7/2022 Next Revision date 22/7/2025
(Maximum 3 years)

Risk Assessment Guide

		Likelihood		
		Likely	Possibly	Unlikely
Severity	Low	3	2	1
	Med	6	4	2
	High	9	6	3

** Risk = Likelihood x Severity

RISK	DECISION PROCESS
< 3	RISK ACCEPTABLE
3, 4	CONSIDER ADDITIONAL RISK CONTROL
> 4	ADDITIONAL RISK CONTROL REQUIRED

Likelihood

- 1 **Unlikely** Not likely to occur (has not occurred in the PI's Lab or similar Lab setup.)
- 2 **Possible** Possible or known to occur (has occurred in the PI's Lab or Similar Lab setup.)
- 3 **Very Likely** Common or repeating occurrence (has occurred repetitively in the PI's Lab or similar Lab setup.)

Severity

- 1 **Low** (e.g. No injury, injury or ill-health requiring first aid treatment only - includes minor cuts and bruises, irritation, ill-health with temporary discomfort)
- 2 **Medium** (e.g. Injury requiring medical treatment or ill-health leading to disability – includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders)
- 3 **High** (e.g. Fatal, serious injury or life-threatening occupational disease – includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning and fatal diseases)

Severity - Consider the magnitude/severity of the consequences of the Risk Factor occurring and then list this as 3 (High), 2 (Moderate) or 1 (Low).

Likelihood - Team should rely upon their experience and consider realistic scenarios. Listed below are examples of factors that may be considered in determining the likelihood.

- Past experience / incidents
- Complexity of the activity
- Number of personnel involved in the activity (e.g. all personnel, a limited number of trained personnel, etc)
- Frequency of use or execution
- Degree of control (involvement of contractors)
- Strength/completeness of administrative controls
- Sufficiency/formality of training
- Other....