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: HPLC for Rapid Separation and Analysis of Caffeine and Tartrazine

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	Preparation of tartrazine standard solution. Tartrazine is weighed using analytical balance according to the calculated amount based on the desired concentration (100 to 500 ppm range) given. The solids are dissolved in deionised water and transferred into a clean volumetric flask (50 to 100 mL).	1) Breakage of glass apparatus (e.g. volumetric flask, beaker).	Injury / cuts from broken glass.	- Visual inspection of glassware before use to ensure that there are no cracks. - 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) Caffeine: Harmful ii) Tartrazine: Non-hazardous	- 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 (<1 g).	1	1	1			
2	Preparation of standard solutions by diluting the respective stocks solutions according to the instructions in the manual.	1) Breakage of glass apparatus (e.g. volumetric flask, beaker).	Injury / cuts from broken glass.	- Visual inspection of glassware before use to ensure that there are no cracks. - 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) Caffeine: Harmful ii) Tartrazine: Non-hazardous	- 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 (<1 g).	1	1	1			
3	Injection of sample solutions into the HPLC machine via the glass HPLC syringe. Refer to the instrument SOP (next to machine) for analysis using HPLC (eluant:100% methanol)	1) Breakage of glass syringe or accidental contact with sharp end of the HPLC 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) Caffeine: Harmful ii) Tartrazine: Non-hazardous	- 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 (Maximum 3 years) 22/7/2025

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-treatening 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....