

NATIONAL UNIVERSITY OF SINGAPORE
FACULTY OF SCIENCE

Experiment-Based Risk Assessment Form

Name of Department	Chemistry	Location of Lab	S7-04
Name of Laboratory	Advanced Chemistry Teaching Lab	Name of PI (lecturer-in-charge)	Dr. Chng Yong Sheng
Name of Lab Officer	Leng Zhi Jin, Wong Ling Rong	Name of Activity/Experiment	CM5176 GIST (Sem 1) Qualitative 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	Dissolve solid sample of NaCl or Na ₂ SO ₄ or NaNO ₃ or Na ₂ CO ₃ or NaSCN in 2-4 mL of di-water	NaNO ₃ : oxidising, irritant, toxic	Harmful if swallowed. Irritant to skin and eyes. May cause fire if heated with flammable chemicals/ materials.	No eating or drinking in lab. Wear gloves, safety glasses, long pants, covered shoes and lab coat. Keep away from heat and flammable chemicals/materials.	2	1	2			
		Na ₂ SO ₄ : irritant	Harmful if swallowed. Irritant to skin and eyes.	Wear gloves, safety glasses, long pants, covered shoes and lab coat.	1	1	1			
		Na ₂ CO ₃ : irritant	Harmful if swallowed. Irritant to skin and eyes.	No eating or drinking in lab. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		NaSCN: toxic, irritant	Health hazard if swallowed. Irritant to skin and eyes.	No eating or drinking in lab. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
2	Separation and identification of Cl ⁻ , Br ⁻ , I ⁻ . Take 1 mL of sample solution and place it in clean test tube, to this add a few drops of HNO ₃ and AgNO ₃ . Separate the precipitate from the supernatant using a centrifuge. To the precipitate add a few drops of diluted NH ₃ , using a plastic dropper, mix well. Separate precipitate from the supernatant. To the supernatant add a few drops of AgNO ₃ . To the remaining precipitate add a few drops of concentrated ammonia solution, using a plastic dripper mix well. Separate remaining precipitate from the new supernatant. To the new supernatant add a few drops of AgNO ₃ .	AgNO ₃ solution: toxic	Harmful if swallowed or inhaled	No eating or drinking in lab. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		AgNO ₃ solution: irritant	irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		HNO ₃ : volatile, toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		HNO ₃ : volatile, corrosive	Corrosive to nose, eyes and skin	Use in fume hood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		NH ₃ : volatile, toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		NH ₃ : volatile, Corrosive	Corrosive to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			
		Centrifuge: Electrical Hazard	Electrocution	Ensure no exposed wires present	2	1	2			
Centrifuge tubes: broken glassware	Cuts from broken glassware	Check centrifuge tubes before using and balance the weight of centrifuge tubes before spinning	2	1	2					
	Identification of carbonates: to the original solid analyte add a few drops of 6M HCl. The carbon dioxide formed can be detected by reaction with an aqueous solution of Ba(OH) ₂ as a white precipitate	HCl: toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood	2	1	2			
		HCl: irritant	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2			

NATIONAL UNIVERSITY OF SINGAPORE
FACULTY OF SCIENCE

3	of barium carbonate	Ba(OH) ₂ solution: toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		Ba(OH) ₂ solution: irritant	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
4	Identification of sulfates: Few mL of the sample solution are acidified with a few drops of HCl (6 M) and barium acetate Ba(CH ₃ COO) ₂	HCl: volatile, toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fumehood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		HCl: volatile, irritant	Irritant to nose, eyes and skin	Use in fumehood. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		Ba(CH ₃ COO) ₂ solution: toxic	Harmful if swallowed or inhaled	No eating or drinking in lab. Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		Ba(CH ₃ COO) ₂ solution: irritant	Irritant to nose, eyes and skin	Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
5	Identification of nitrates (I): Few drops of the soda extract (analyte solution) are put on a spot plate together with few drops of conc. acetic acid (pH = 4 – 5). Then two drops of sulfanilic acid and 1-naphthylamine, as well as zinc powder (a spatula tip/end), are added.	CH ₃ COOH	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood	2	1	2		
		CH ₃ COOH: corrosive	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	1	1	1		
		Sulfanilic acid: toxic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood	2	1	2		
		Sulfanilic acid: irritant	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		1-naphthylamine: toxic, carcinogenic	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood	2	1	2		
		1-naphthylamine: irritant	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	2	1	2		
		Zinc	Harmful if swallowed or inhaled	No eating or drinking in lab, use in fume hood	2	1	2		
		Zinc: Irritant	Irritant to nose, eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat	1	1	1		
		Zinc: Flammable	Fire	Keep away from sparks. No open flame is used in lab	2	1	2		
6	Identification of nitrates (II): Add a few drops of an acidic FeSO ₄ solution to the sample. Slowly add conc. H ₂ SO ₄ (2-5 ml) to form a layer under the aqueous solution.	FeSO ₄ solution: Toxic	Harmful if swallowed or inhaled	No eating or drinking in lab.	2	1	2		
		FeSO ₄ solution: Irritant	Irritant to eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat.	2	1	2		
		H ₂ SO ₄	Harmful if swallowed or inhaled	No eating or drinking in lab.	2	1	2		
		H ₂ SO ₄ : Corrosive	Corrosive to eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat.	2	1	2		

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7	Identification of SCN-: To the sample solution add a few drops of HNO ₃ (6 M) and an excess of Fe ₂ (SO ₄) ₃ solution	Fe ₂ (SO ₄) ₃	Harmful if swallowed or inhaled	No eating or drinking in lab.	2	1	2		
		Fe ₂ (SO ₄) ₃ : Irritant	Irritant to eyes and skin	Use in fume hood, Wear gloves, safety	1	1	1		
		HNO ₃	Harmful if swallowed or inhaled	No eating or drinking in lab.	2	1	2		
		HNO ₃ : corrosive	Corrosive to eyes and skin	Use in fume hood, Wear gloves, safety glasses, long pants, covered shoes and lab coat.	2	1	2		

Conducted By

Name Dr. Chng Yong Sheng

Signature 

Date 1/6/2022

Approved By

Name Assoc Prof Yeo Boon Siang

Signature 

Approval date 1-Jun-22 Next Revision date 31-May-25
(Maximum 3 years)