

Department of Chemical Technology Faculty of Science Chulalongkorn University	Form: ScFM-CT-04-003-A	
	Risk and readiness assessment form (to be assessed prior to research work)	Editing order 7
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☐	B.Sc
☐	M.Sc, PhD
☐	Others

Student name Student ID Mobile phone Email

Student name Student ID Mobile phone Email

Department / Program..... Field of study Laboratory/Research lab (Main)

Research title / Project

Advisor Co-advisor

If there is a total change to the research work or a change from the advisor or an accident happens, the risk assessment has to be reviewed again.

Materials and Chemicals

- 1) Quantity used State (G/ L/ S) Hazardous level (H= /F= /R= /S=)
- 2) Quantity used State (G/ L/ S) Hazardous level (H= /F= /R= /S=)
- 3) Quantity used State (G/ L/ S) Hazardous level (H= /F= /R= /S=)
- 4) Quantity used State (G/ L/ S) Hazardous level (H= /F= /R= /S=)
- 5) Quantity used State (G/ L/ S) Hazardous level (H= /F= /R= /S=)

* Give the quantity used per batch or per project *State (G/L/S) = (Gas/Liquid/Solid)

* Note: Explanation of NFPA level is attached at the back of the form.

Material Handling and Inventory

Material/Chemical	Quantity (Approximate)	Storage	Describe hazardous condition from false storage

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Waste Generated (Raw material/Chemical) and Waste Treatment and Management

(Name) Waste list	Type / characteristic according to waste track	Quantity (Approximate)	Correct method of treatment according to waste track

Planning of analysis equipment usage

- 1)Date.....Laboratory.....
- 2)Date.....Laboratory.....
- 3)Date.....Laboratory.....
- 4)Date.....Laboratory.....
- 5)Date.....Laboratory.....
- 6)Date.....Laboratory.....
- 7)Date.....Laboratory.....

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Inspection of equipment for research work**Research work**
☐ new ☐ existing work
Frequency of use
☐ continuous ☐ 2-3 times per day ☐ 2-3 times per week

☐ Others, please specify.....

Duration of experiment [] equipment operation less than 12 hr./experiment

[] equipment operation longer than 12 hr./experiment

Hazardous Assessment

Subject	Yes	No	N/A	Subject	Yes	No	N/A
Having a system to protect access to the equipment (a sign or a symbol warning of dangers from the equipment or the research work)				Having an emergency stop			
Equipment/research work is securely installed on the floor				Emergency stop system is easily observed and accessible.			
No objects on the footpath around the equipment or the research work				Emergency stop system is workable.			
Having a system designed to limit protection				No odor/dust from equipment or research work that creates nuisance			
Having a protection system designed for emergency				No loud noise that creates nuisance			

*** In case of new equipment, please attach the research work equipment design or structure

Assessment of operating condition
☐ Pressure used in the experiment kPa. ☐ Temperature range used in the experiment °C

☐ Heating (if any) by [] LPG [] Steam
 [] Electric coil stove [] Water bath

☐ Others

☐ The experiment has flammable substances/ flammable solvents

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Hazard Analysis (assessment of hazard and toxicity of chemicals that may occurred from the operation)

1. Personal level

Description of hazard	Risk level (from calculation)			Cause	Method of protection, remediation and risk reduction
	A-E	I-V	Level		

2. Project level

Description of hazard	Risk level (from calculation)			Cause	Method of protection, remediation and risk reduction
	A-E	I-V	Level		

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- Conclusion of risk level in total Personal level..... Project level.....
(e.g. low, medium, high)

**** Examples of risk calculation (risk rating) is attached at the back of the form.**

The student has prepared for the operation according to all the required steps and understood the operation well.
The advisor suggests that the approval can be given to the student to start his or her research work by having a laboratory teacher in the related laboratory as a supervisor.

Signed by the advisor Date Approved to carry out the research work

Signed by a laboratory/research officer..... Date

Signed by the head of the laboratory/research Date

Safety is the heart of laboratory work

**** Attached Note**

NFPA code has 4 specific color symbols as follows

- Blue (H) indicates hazard to health
- Red (F) indicates hazard to flammability
- Yellow (R) indicates hazard to reactivity
- White (S) indicates symbol specific to health, flammability, reactivity by numbers from 0 (non-hazard as normal chemical) to 4 (highest hazard)

H – Health

- 4 Receive or expose in a very short period of time may result in death or serious injury (e.g. hydrogen cyanide)
- 3 Receive or expose in a short period of time may result in temporary health hazard or permanent health hazard (e.g. chlorine gas)
- 2 Receive or expose for interval period of time or for continuous but not regular period may result in temporary disabled or permanent health impact (e.g. ammonia gas)
- 1 Receive or expose may cause irritation or result in small scar (e.g. turpentine)
- 0 Receive or expose when hot cause small effect to health (e.g. peanut oil)

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Read – Flammability (F)

- 4 A substance that can be volatile quickly and completely at normal pressure and temperature or can be distribute in air and easily burn with flash point lower than 23°C (e.g. propane)
- 3 Solid or liquid that can be burned in normal environment and temperature, flash point is between 23 - 38°C (e.g. gasoline)
- 2 Burn when heat with medium to high heat, flash point is between 38 - 93°C (e.g. diesel oil)
- 1 Burn when heat for a long time, flash point is higher than 93°C (e.g. canola oil)
- 0 Inflammable or will not burn (e.g. Argon)

Yellow – reactivity (R)

- 4 May explode or detonate
- 3 Heat and shock or bump may explode or detonate
- 2 React violently
- 1 Unstable with heat and pressure
- 0 Stable

White – Specific symbol (S)

- ALK Alkaline (base)
- ACID Acid
- COR Corrosive
- OX Oxidizer
-  Radiation hazard
- W React with water

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Examples of hazard level description and risk level calculation

Level	Possibility of Occurrence		
	Possibility	Explanation	Occurrence
A	Almost certain	An event will occur every year.	Once a year or more
B	Likely	An event will occur many times or more during work.	Once every 3 years
C	Possible	An event may occur during work.	Once every 10 years
D	Unlikely	An event may occur in some place sometime.	Once every 13 years
E	Rare	Heard that an event occurred before somewhere.	Once every 100 years

Level of Severity	Type of Outcome	
	Health and Safety	Environment
V Highest (Disaster)	Cause high number of death or obvious danger to more than 50 people	Cause long term and severe deterioration to environment and ecosystem with critical concern
IV High	Cause death or severe and permanent health impact (>30%) to 1 people or more	
III Medium	Cause medium health impact or defective (<30%) to 1 people or more.	Severe impact to environment in medium term
II Low	Cause curable defective or health impact and need to be admitted to a hospital	Impact to environment is within short to medium term and no impact to ecosystem
I Very low	Low impact to health and do not need to be admitted to a hospital	Low impact to lives and physical environment

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Level of Possible Occurrence	Level of Severity and Outcome				
	I	II	III	IV	V
A	Medium	High	High	Very High	Very High
B	Medium	Medium	High	High	Very High
C	Low	Medium	High	High	High
D	Low	Low	Medium	Medium	High
E	Low	Low	Medium	Medium	High

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