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GUIDELINES OF CHEMICAL MANAGEMENT			

1.0 INTRODUCTION

The procurement of hazardous chemicals is the first entry of a hazard into the workplace. The use of hazardous materials creates a variety of risks, thus the person ordering chemicals must be aware of the potential hazards of the substances being ordered. Certain hazardous chemicals are regulated and must comply with regulation before proceeding for purchasing.

2.0 PURPOSE

To guide the management of chemicals for research, teaching and learning purposes on campus. It is also to ensure that compliance issues promulgated by applicable regulatory agencies are considered and addressed before a chemical material is procured. These agencies include Department of Occupational Safety and Health (DOSH), Department of Environmental (DOE) and Ministry of Health Malaysia.

3.0 RESPONSIBILITY AND ACCOUNTABILITY

Purchases must be performed in accordance with UTM's procurement procedures. The Occupational Safety and Health (OSH) risks associated with the purchase must be identified and managed as part of this purchasing process. All parties involved in the chemical purchase, receipt and/ or use of the chemicals including staff, students, and other external parties, are responsible for ensuring the purchasing arrangement include OSH considerations and arrangement, the chemical received can be used before the expired date, can be stored safely by the receiver and can be disposed as according to the law.

4.0 ORDERING CHEMICALS

There are several considerations related to risk control before purchasing the chemicals. Considerations should be given to:


4.1 Elimination and Substitution

- **Safer alternative**

Investigate other chemicals, methods and procedures that may not require the use of chemicals hazardous to health. The amount and type of waste generated from an activity should be considered.

- **Substitution of less hazardous chemicals**

Choose less hazardous chemicals instead of the one currently used which have more risk. Some major considerations to look at when considering the suitability of potential substitutes are the effectiveness, the compatibility, existing control measure, waste disposal and hazard assessment. For example, hexane can be substituted with heptane. N-heptane will not form toxic metabolites.

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- **Reduce the size**

Always purchase minimal volumes for the rate of use that is required. For example, if only 50 g will be required within a six-month period, buy only 50 g pack size. If large quantities are purchased and then not used, they will require disposal at some point in the future which may increase the cost needed.

- **Reduced the concentration**

Higher concentration of chemicals has a higher potential risk. Always purchase the lowest concentration of chemicals that is as far as practicable for the activity.

4.2 Engineering and Isolation

- **Access to adequate storage facilities**

Always take into consideration chemical incompatibility, space and stability. For example:

- An oxidising chemical should not be placed near the flammable chemicals.
- The chemical cabinet has enough space for the new chemicals.
- Refrigerators are available for chemicals which require low temperature storage.

- **Access to specific facilities required for handling**

For example, a fume cupboard or local exhaust ventilation (LEV) is provided and well-functioning which is required as the risk control for chemicals that produce corrosive fumes, stench/ odour or flammable vapours.

5.0 ADMINISTRATION AND PERSONAL PROTECTIVE EQUIPMENT

5.1 Regulatory Authorisation

There are a range of specific requirements for regulated chemicals. Check with the relevant authorities.

5.2 Safety Data Sheet (SDS)

SDS is a document which contains relevant information of the chemicals and is furnished in pursuance of the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 (CLASS Regulations). It is a regulatory requirement that manufacturer or supplier of a chemical provide an SDS for the chemical purchased, thus please make sure the supplier that has been chosen to supply your chemical is able to supply it together with the SDS. Hard copy of SDS may be provided with the delivery of the chemical. If an online system or email is used to provide the soft copy of SDS, the SDS must be printed as the reference in the workplace where hazardous chemicals are used and stored. It is under the responsibility of the user to make sure that the SDS can be easily accessible and updated following the correct format. The correct format of SDS contains the following information accordingly:

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Section 1:

Identification of the hazardous chemical and of the supplier.

Section 2:

Hazard Identification.

Section 3:

Composition and information of the ingredients of the hazardous chemicals.

Section 4:

First-aid measures.

Section 5:

Fire-fighting measures.

Section 6:

Accidental release measures.

Section 7:

Handling and storage.

Section 8:

Exposure controls and personal protection

Section 9:

Physical and chemical properties.

Section 10:

Stability and reactivity.

Section 11:

Toxicology information.

Section 12:

Ecological information.

Section 13:

Disposal information

Section 14:

Transportation information.

Section 15:

Regulatory information

Section 16:

Other information.

5.3 Labelling and Relabelling

Ensure all chemicals purchased for teaching and research purposes adhere to the CLASS Regulations. A supplier shall label every packaging of hazardous chemicals legibly and indelibly, containing the following information:

5.3.1 Size of bottle >125mL


- Product identification
- Supplier identification
- Hazard statement
- Signal word
- Hazard pictogram
- Precautionary statement

5.3.2 Size of bottle <125mL

- Product identification
- Supplier identification
- Signal word
- Hazard pictogram
- "Read SDS before use" statement

5.4 First Aid, Emergency Response and Personal Protective Equipment (PPE)

Please refer to the SDS supplied with the chemicals.

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5.5 Training and Safe Work Procedure

Appropriate training must have been completed by those workers who are going to use the procured chemicals. A safe work procedure must be completed for all high-risk activities with workers trained and deemed competent in that procedure. Workers undertaking an activity with a high-risk chemical must have experience in handling hazardous chemicals.

6.0 RECEIVING THE CHEMICAL

To ensure that compliance issues promulgated by applicable regulatory agencies are considered and addressed before a chemical entered the campus. These agencies include Department of Occupational Safety and Health (DOSH), Department of Environmental (DOE), Energy Commission and Ministry of Health Malaysia.

6.1 Inspection of Chemicals Upon Arrival

The receiver must ensure that the packaging of the hazardous chemicals that been given meet the following requirements:

- i. The packaging should be able to contain the chemical/ substance properly unless a safety device is required to be fitted to the packaging.
- ii. The materials used for packaging should be inert to the contents.
- iii. The packaging and fastening should be strong and durable.
- iv. Replaceable fastening devices should be reliable to ensure that the contents would not escape/ spill.
- v. The packaging/ valve should also be sealed initially whereby the seal could not be repaired once it is opened.

Upon receiving the chemicals, use this checklist to inspect:

Checklist	Yes	No
The special requirements of the chemicals are met. Example: refrigerator, secure/ locked storage/ received by an authorised person.		
Delivered chemicals is as described when ordered.		
Packaging is free from contamination.		
Delivered chemicals has clear labelling comply with CLASS Regulations.		
Invoice and delivery order is provided for finance purposes.		

When a chemical arrives at the workplace, please make sure the following aspects are complied:

Checklist	Yes	No
Update the Chemical Inventory (CI) and Chemical Register (CR).		
Ensure the current SDS is accessible.		
Write date of receipt on chemical container.		
Store the chemicals correctly and safely.		



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7.0 SAFE TRANSPORTATION AROUND CAMPUS

Transporting chemicals is one of the riskiest procedures that takes place in the laboratory and around campus as it may lead to accidental release and exposure of chemicals. However, by taking the right pre-cautions and procedures while handling and transporting chemicals, you can minimize the danger to yourself, others and the environment. The following guidelines shall be followed when moving chemicals on campus:

- 7.1 Chemical user must read the SDS before handling any chemicals. Determine the proper shipping name/ basic description on transportation of chemicals as provided in the SDS. Individuals transporting chemicals must be familiar with the hazards presented and know what to do in the event of incidents such as instant release or spillage.
- 7.2 Wear appropriate PPE while transporting the chemicals. Lab coat, safety glasses, chemical resistant gloves are some of the PPE that should be worn if hazardous chemicals might splash on skin or eyes if spilled during transport.
- 7.3 Label all chemical containers as to their contents.
- 7.4 Hazardous chemicals must be always attended while being transported.
- 7.5 Use secondary container that can contain all materials in the event of breakage or spillage.
- 7.6 Do not place incompatible chemicals together in the same container during movement. For example, chromic acid (oxidizing acid) and ethyl acetate (flammable liquid) should not be transferred on the same cart. This will prevent unwanted chemical reactions in the events of leaks or spillage.
- 7.7 Transport only the minimum amount of material in the lowest concentration commensurate with the demonstration or educational activities.
- 7.8 Plan route and destinations to minimize travel time and distance while transporting hazardous materials.
- 7.9 Avoid transporting chemicals in a passenger vehicle. Never leave chemicals unattended or stored in a vehicle.
- 7.10 Hazardous chemicals must not be left or stored in corridors, departmental offices, or other non-laboratory locations.
- 7.11 Immediately update CI to reflect the relocation of chemicals.

8.0 REFERENCES

- 8.1 Occupational Safety and Health (Use and Standard of Exposure Chemical Hazardous to Health) Regulations 2000 (USECHH Regulations).
- 8.2 Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 (CLASS Regulations)
- 8.3 Guideline for Chemical Procurement, University of Sydney.
- 8.4 HWS OHS Purchasing Standard.
- 8.5 Chemical Safety Procedure, University of Cambridge.
- 8.6 Chemical Procurement Program, Cleveland State University.

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- 8.7 Occupations Safety and Health Act 1994 (Act 514)
- 8.8 UN Recommendations on the Transport of Dangerous Goods - Model Regulations. URL: <http://www.unece.org/?id=3598>
- 8.9 Guidelines on Storage of Hazardous Chemicals: A Guide for Safe Warehousing of Packaged Hazardous Chemicals. 2005. Department of Occupation Safety and Health Malaysia. URL: <http://www.dosh.gov.my/index.php/en/legislation/guidelines/chemical>
- 8.10 Safely Transporting Chemicals on Campus. 2008. Columbia University. URL: <http://ehs.columbia.edu/chemtrans.html>
- 8.11 Transporting Chemicals Safely on Campus. 2002. Environmental Health and Safety University of California Berkeley. URL: <http://ehs.berkeley.edu/sites/default/files/lines-of-services/workplace-safety/17transportchem.pdf>
- 8.12 Guidelines for Moving Chemicals on Campus. Wright State University. URL: <http://www.wright.edu/sites/www.wright.edu/files/page/attachements/MovingChemicalGuidelines.pdf>

9.0 GENERAL/ AMENDMENT

Issue No.	Review No.	Amendment Details	Effective Date
1	0/2023	New guidelines from revision of: <ul style="list-style-type: none"> • Guidelines of Procurement - Chemicals for Research (CMC/SOP/9) • Guidelines for Safe Transporting of Chemicals on Campus (CMC/SOP/1) • Guidelines to Receive Chemical & Gas from Industry (CMC/SOP/10) 	01/12/2023