Appendix 2: Designated Substance Assessment Form

A Designated Substance Assessment Form must be completed for each designated substance present onsite. This includes,

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl chloride

Contact Health and Safety (healthandsafety@trentu.ca) for questions regarding this document.

Designated Substance: Acrylonitrile

Date: Department:

Location that substance is stored in (Building and room number(s)):

If multiple locations, list each location

Manager (Name): Signature:

Assessment Prepared by (Name): Date Prepared:

Project End Date (if applicable):

Signature: Title:

Section A. Worker Exposure

1. In what form is the designated substance obtained?

   ◯ Solid ◉ Liquid ◯ Gas

   a. Chemical or product name:

   b. CAS Registry Number:

   c. Type of container (e.g., bottle, box, vial, etc.):

   d. Is the product in the original supplier bottle?

      ◯ Yes ◯ No If no, explain:

   e. Size and quantity of container(s) (e.g. 5gx1 bottle):

   f. Is the material volatile (can it evaporate into the air)? ◯ Yes ◯ No

   g. Is the material of small enough particle size that it can be dispersed through the lab?

      ◯ Yes ◯ No

   h. Approximate timeline of project of project using the Designated Substance (e.g., Jan. 2023 – Dec. 2025):

   i. What PPE and engineering controls are necessary to protect workers from exposure to the Designated Substance?

2. Is the form of the designated substance altered as it is used?

   ◯ No

   ◯ Yes

If yes, provide the name of the altered form:

3. Is there a likelihood of the substance being released into the work environment during normal use?

   ◯ No

   If no, explain:

   ◯ Yes

   If yes:

   a. Describe the stage of the operation and/or areas where this can occur:

   b. Specific the job functions and the approximate number of employees who might be exposed:

   c. Indicate how people could be exposed:

   ◯ Inhalation ◯ Ingestion ◯ Skin absorption

Worker Exposure Conclusions

4. Are there any activities or situation where exposure by any route is possible? (If you answered yes in question 3, then the answer is “Yes” here.)

   ◯ No

   ◯ Yes

5. Is protection against exposure dependent on some level of engineering control (e.g., a fume hood),

operating procedures, and/or personal protective equipment that can fail or deteriorate?

- ◯ No
- ◯ Yes

If the answer to both questions 4 and 5 is "No":

Place and maintain a copy of this assessment in a location that is readily accessible to workers in your work area. In laboratories, it is strongly suggested that a copy is posted inside the lab next to the door. A copy may also be placed in the WHMIS / SDS binder alongside the SDS for the chemical which contains a Designated Substance. Place a completed copy of the sign template in Section D in a conspicuous location outside the lab, such as on the lab door or wall beside the lab door, where individuals will see it before entering the lab.

Provide a copy of this assessment and a current Safety Data Sheet for the chemical to Health and Safety (healthandsafety@trentu.ca) for review by the Joint Health and Safety Committee.

No further action is necessary.

If the answer to either question 4 or 5 is "Yes":

Complete Section B (Worker Health Impact Assessment).

Section B. Worker Health Impact Assessment

This section will assess the worker health impact due to exposures identified above in Section A.

CCOHS – Occupational Hygiene

Calculating TWA

1. Is worker exposure possible during normal operating or use conditions?

   - ◯ No, continue to 2.
   - ◯ Yes, If yes, complete the following:

     a. How might that exposure occur (list possibilities):

b. Is possible exposure likely to exceed the Time Weight Average Limit (WTA), the Short-Term Exposure Limit (STEL), or the Ceiling Limit (CL) as defined in the Regulation 490/09 for this product (see Appendix A)?

- ◯ No
- ◯ Yes

2. Is worker exposure possible during emergency situations (such as spills or containment failure)?

- ◯ No, If no, continue to 3.
- ◯ Yes, If yes, complete the following:

a. How might that exposure occur? (list all possibilities)

b. Is exposure likely to exceed the TWA, STEL, or CL? (see Appendix A)

- ◯ No
- ◯ Yes

If exposure may occur but would be below the TWA, STEL or CL then you do not need a control program. Place a copy of this assessment with the SDS in your SDS binder and forward this assessment and a current SDS to Health and Safety (healthandsafety@trentu.ca) for review by the JHSC. You may be contacted for additional information. No further action is required.

If you answered Yes to any of the questions above and the exposure is likely to exceed any of the TWA, STEL or CL then a formal Control Program is required. For each exposure incidence listed above, describe the Controls (engineering, operational, PPE) which would ensure that no worker will be exposed to the material in concentrations or amounts greater than the TWA, STEL or the CL. The Table below can be used to develop this program. For assistance contact Science Facilities or Human Resources.

Once completed forward this assessment, your control program (Section C), and a current version of the SDS to Health and Safety (healthandsafety@trentu.ca) by the JHSC. You may be contacted for additional

information. Ensure your laboratory personnel are aware of and follow the procedures for the Control Program Place and maintain a copy of this assessment in a location that is readily accessible to workers in your work area. In laboratories, it is strongly suggested that a copy is posted inside the lab next to the door. A copy may also be placed in the WHMIS / SDS binder alongside the SDS for the chemical which contains a Designated Substance.

Section C. Control Program

A control program is necessary when an assessment indicates there is a possibility of an exposure to a designated substance and that exposure may exceed any one of the TWA, STEL or CL for that substance. The control program that you put in place will need to address all of the incidences when exposure to high levels of the material may occur and the engineering controls, operational controls and Personal Protective Equipment (PPE) which will be used which will ensure that the exposure does not have a negative health effect on a worker.

Incidence #	Description of incident causing exposure	How often this incident may occur? (common, uncommon, rarely, accidental)	Total number of potentially exposed workers	Control Description (Engineering, Operational and PPE)	Other Controls
1					
2					
3					
4					

5					

Examples

Incidence #	Description of incident causing exposure	How often this incident may occur? (common, uncommon, rarely, accidental)	Total number of potentially exposed workers	Control Description (Engineering, Operational and PPE)	Other Controls
1	Fumehood failure	rarely	1	Cap material, close sash, step back, Post FH and contact Fixit	
2.	Air exposure to the volatile chemical while dispensing	common	3	Always work in a fumehood with an open source of chemical, Personnel trained to work with material	
3	Spill of material	accidental	1	Cover material Exit room, Don appropriate PPE, prepare spill cleanup supplies, if safe to do so, clean up spill Report spill to Security.	If a respirator required, ensure it has been fit tested by personnel performing clean up. Personnel must be properly trained to clean up spill.
4.	Weighing out solid material to make a stock solution	common	1	Use a closed balance to contain small particles, wear P100 respirator or perform in a glove box,	If a respirator is required ensure it has been fit tested by personnel

These are just generic examples; every incidence of exposure will be unique and will likely have unique controls. Once complete and the JHSC has reviewed and accepted the Control Program, ensure you train your lab personnel and place this document in the SDS binder with the appropriate SDS. It might also be a good idea to post the Control Program in the lab (Bulletin Board) where it can easily be read and followed.

Section D. Control Program Signage

Place a completed copy of the sign template in a conspicuous location outside the lab, such as on the lab door or wall beside the lab door, where individuals will see it before entering the lab.

This laboratory currently has a Designated Substance in use.

Designated substance in use:

Project end date:

Please refer to the Designated Substance assessment within the SDS folder for further information on exposure controls in place for protection of workers.

Appendix 3: Exposure Limits of Designated Substances (from O. Reg. 490/09)

Designated Substance [CAS No.]	Time-Weighted Average Limit (TWA), Short-Term Exposure Limit (STEL), Ceiling Limit (C) and Notations		
	TWA	STEL/C	Notations
Acrylonitrile [107-13-1]	2 ppm	C 10 ppm	Skin
Arsenic, elemental arsenic and inorganic compounds [7440-38-2], and organic compounds (only where both inorganic and organic compounds are present), as As.	0.01 mg/m^3	0.05 mg/m^3	
Asbestos – All forms [1332-21-4]	0.1 f/cc (a)		
Actinolite [77536-66-4]	0.1 f/cc (a)		
Amosite [12172-73-5]	0.1 f/cc (a)		
Anthophyllite [77536-67-5]	0.1 f/cc (a)		
Chrysotile [132207-32-0]	0.1 f/cc (a)		
Crocidolite [12001-28-4]	0.1 f/cc (a)		
Tremolite [77536-68-6]	0.1 f/cc (a)		
Benzene [71-43-2]	0.5 ppm	2.5 ppm	Skin
Coke Oven Emissions[1]	0.15 mg/m^3		
Ethylene oxide [75-21-8]	1 ppm	10 ppm	
	1.8 mg/m^3	18 mg/m^3	
Isocyanates, organic compounds			
Toluene diisocyanate (TDI) [584-84-9] [91-08-7]	0.005 ppm	C 0.02 ppm	
Methylene bisphenyl isocyanate (MDI) [101-68-8]	0.005 ppm	C 0.02 ppm	

Hexamethylene diisocyanate (HDI) [822-06-0]	0.005 ppm	C 0.02 ppm	
Isophorone diisocyanate (IPDI) [4098-71-9]	0.005 ppm	C 0.02 ppm	
Methylene bis (4-cyclohexylisocyanate)	0.005 ppm	C 0.02 ppm	
[5124-30-1]			
Lead [7439-92-1] elemental lead, inorganic and organic compounds of lead, as Pb			
Elemental lead, inorganic and organic compounds of lead, as Pb except tetraethyl lead [78-00-2]	0.05 mg/m^3		Skin (organic compounds)
Tetraethyl lead, as Pb [78-00-2]	0.10 mg/m^3	0.30 mg/m^3	
Mercury [7439-97-6], elemental mercury, inorganic and organic compounds of mercury, as Hg			
All forms of except alkyl, as Hg	0.025 mg/m^3		Skin
Alkyl compounds of, as Hg	0.01 mg/m^3	0.03 mg/m^3	Skin
Silica, Crystalline			
Quartz/Tripoli [14808-60-7; 1317-95-9]	0.10 mg/m^3 (R)		
Cristobalite [14464-46-1]	0.05 mg/m^3 (R)		
Vinyl chloride [75-01-04]	1 ppm		

Endnotes and Abbreviations:

[1] Means the benzene soluble fraction of total particulate matter of the substances emitted into the atmosphere from metallurgical coke ovens including condensed vapours and solid particulates.

[CAS No.] - CAS Registry Number.

f/cc - Fibres per cubic centimetre of air.

mg/m3 - Milligrams of the agent per cubic metre of air.

mg/m3 - Milligrammes par mètre cube d'air.

ppm - Parts of the agent per million parts of air by volume.

ppm - Parties par million de parties d'air par volume.

Skin - Danger of cutaneous absorption.

Peau - Danger d'absorption cutanée.

(F) Respirable fibres: length > 5 µm; aspect ratio ≥ 3:1, as determined by the membrane filter method at 400-450 times magnification (4-mm objective), using phase-contrast illumination.

(R) Respirable fraction: means that size fraction of the airborne particulate deposited in the gas-exchange region of the respiratory tract and collected during air sampling with a particle size-selective device that, (a) meets the ACGIH particle size-selective sampling criteria for airborne particulate matter; and (b) has the cut point of 4 µm at 50 per cent collection efficiency.

(a) Asbestos fibres longer than 5 µm in length and less than 3 µm in width and that have a length to width ratio not less than 3:1 as viewed in a phase contrast optical microscope at 400-450 times magnification.