

## SAFE METHOD OF USE

### HSNO CLASS 6.1 – ACUTELY TOXIC SUBSTANCES (SOLIDS, LIQUIDS)

*Date last reviewed: 8 September 2008*

#### A. GENERAL

- This Safe Method of Use (SMoU) provides guidelines for the safe handling of solid and liquid substances with a HSNO Class 6.1 classification.
- Be aware that most hazardous substances have multiple HSNO classifications and this SMoU should be used in conjunction with the SMoU for any other HSNO classifications relevant to the substance being used.
- The Safety Data Sheet (SDS) for a substance should always be consulted for information about any specific hazards and handling requirements for that substance. *Ideally, the SDS will be obtained from the 'Chemwatch' database (<http://full.chemwatch.net/cg2>), which is updated regularly and contains New Zealand relevant information.*
- Where possible, the advice, instruction or training of a more experienced laboratory user (e.g. supervisor, laboratory manager) should *always* be sought when handling any hazardous substance that a laboratory user is unfamiliar with – this SMoU should supplement, rather than replace, such advice, instruction or training.
- Highly toxic gases of HSNO Class 6.1 are not covered by this SMoU.

#### B. CLASSIFICATION

- Substances with a HSNO Class 6.1 (Acute Toxicity) classification may cause serious harm or death through a single exposure and are classified by two main criteria;
  1. **The route of exposure**
    - a) Oral – toxic by ingestion.
    - b) Dermal – toxic by absorption through the skin.
    - c) Inhalation – toxic by inhalation of gases, vapours, dusts or mists.
  2. **The degree of toxicity**
    - a) The LD<sub>50</sub> (for Oral or Dermal toxins) = the amount of a substance per Kg of body weight (mg/Kg bw) that would kill 50% of a test species population.
    - b) The LC<sub>50</sub> (for Inhalation toxins) = the air concentration (ppm or mg/L) of a substance that would kill 50% of a test species population.
- Depending on the route of toxicity and the degree of toxicity (refer Appendix 1) a substance is categorised from 6.1A – 6.1E, with 6.1A representing the highest degree of acute toxicity and 6.1E representing the least degree of acute toxicity.
- A substance may be toxic through more than one route (e.g. phenol is acutely toxic by inhalation, dermal and oral routes of exposure).

### C. INCOMPATIBILITIES

- Be aware that some solid and liquid HSNO Class 6.1 substances, when mixed and/or reacted with other substances, may release toxic gases, e.g. mixing of acids with solid cyanide compounds can release highly toxic hydrogen cyanide gas. The SDS for a substance will detail any known incompatible substances. A list of some common examples is given in Appendix 2. This list is not exhaustive. *If it is intended to deliberately generate acutely toxic gases then these must be handled in accordance with the SMOU for Acutely Toxic Gases.*

### D. STORAGE

- Many substances with a HSNO Class 6.1 classification will also have other HSNO Classifications. Refer to the guidelines of the 'Safe Storage of Hazardous Substances in the Laboratory (HSNO Exempt)' SMOU to determine what HSNO classification a substance should be stored by. Where these guidelines indicate that a substance should be stored as HSNO Class 6, follow the guidelines below (otherwise refer to the relevant SMOU).
- The quantities of HSNO Class 6.1 substances being stored in a laboratory should be kept to the minimum required for the work being undertaken. Where storage of bulk quantities of HSNO Class 6.1 substances is required (as a guideline, more than 100Kg solids or 100L liquids), these should be stored in a certified hazardous substances location under the supervision of an Approved Handler.
- Containers of HSNO Class 6.1 substances not in use should be kept in dedicated storage areas. Such storage areas might consist of shelves or cabinets, either within the laboratory or in a separate storage room. Storage in these areas must meet the following requirements;
  - a) HSNO Class 6.1 substances must be kept segregated from other HSNO Classes, from any incompatible substances (refer section (C) above) and from non-hazardous substances. Segregation may be achieved by storing substances on a separate shelf or in dedicated storage cabinets. Liquids must have secondary containment (e.g. a plastic tray) and should be stored separately of solids. HSNO Class 6.1 substances should not be stored immediately below or above incompatible substances (especially liquids). Shelves and cabinets used as storage areas should be clearly labelled with the appropriate GHS or UN pictogram (refer Appendix 3).
  - b) Containers of HSNO Trackable substances (which includes all HSNO Class 6.1A-C substances) must either be segregated from other HSNO Class 6.1 substances or otherwise ordered in such a manner that individual containers of Trackables can be easily and quickly found (e.g. by alphabetically ordering all HSNO Class 6.1 substances such that they can be easily found by name). Containers of Tracked substances should be labelled with the appropriate 'T' symbol (refer Appendix 3).
  - c) Note that where storage in underbench cabinets is desirable, Class 6 Hazardous substance cabinets (with built-in secondary containment) are available for this purpose.

- Where it is necessary to store HSNO Class 6.1 substances in a refrigerator or freezer, continue to follow the guidelines above. In addition, multiple containers of HSNO Class 6 substances (solid or liquid) should be kept together in a larger secondary container (e.g. plastic tray or box), which must be labelled with the appropriate GHS pictogram. Larger containers (as a guideline, greater than 1L) should be stored on the lowest shelf possible. The outside of any fridge/freezer used to store HSNO Class 6.1 substances should also be labelled with the appropriate GHS or UN pictogram (refer Appendix 3).
- In accordance with the HSNO (Exempt Laboratories) Regulations (2001), laboratories in which HSNO Class 6.1 substances are stored **MUST** be locked when not in use/unattended.

#### E. DOCUMENTATION

- It is a requirement of the HSNO (Exempt Laboratories) Regulations (2001) that a record of all individual containers of Trackable substances be kept (this includes by default all HSNO Class 6.1A-C substances). At a minimum these records must include the name, HSNO classifications, container size and room location of all containers of Trackable substances that are either currently being stored or have been stored within the previous 12 months.
- SDS for any hazardous substance stored and used in the laboratory must be available to all laboratory users. For the majority of substances, SDSs are available through Chemwatch and all laboratory users should be able to access SDSs through Chemwatch. Where a substance is not listed in Chemwatch the laboratory user must ensure that a SDS is obtained from the supplier (the Health and Safety Office should also be notified of any substance not listed on Chemwatch).
- For HSNO Class 6.1A-6.1C (highly toxic and tracked) substances, a folder containing hard-copies of all SDS should be easily and quickly accessible to all laboratory users.

#### F. USE

- At a minimum, all University of Otago Laboratory Rules (as specified in the University of Otago HSNO Exempt Compliance Manual) must be followed.
- Be aware that many substances have multiple HSNO classifications and that substances stored under other classifications (e.g. HSNO Class 3.1, Flammable liquids) may also be classified as HSNO Class 6.1. Always ensure that you are aware of all the hazards (and HSNO Classifications) associated with a substance and have consulted the SDS and any relevant SMOU. *Where any conflict exists between any two or more SMOU then the more stringent guideline should be followed.*
- Any HSNO Class 6.1 substance that is a significant inhalation hazard (i.e. releases hazardous quantities of toxic dust, gases, vapours or mists into the air) **must** be handled in a fume hood (or with some other specialised ventilation system approved for use with that substance by the University of Otago Health and Safety Compliance office). *Be aware that even solids and liquids can generate inhalation hazards, e.g. solid Acrylamide (6.1C) forms very fine particles that are easily dispersed by small air movements and through electrostatic attraction, while liquid Formaldehyde (6.1B) generates toxic fumes.*

- Any HSNO Class 6.1 substance that is a significant dermal exposure hazard (i.e. is readily absorbed through the skin) should be handled in a fume hood and/or with additional personal protective equipment as detailed in section (G).
- When working with Class 6.1 substances be aware of the potential for toxic gases to be generated – refer Section (C) above.

#### **G. PERSONAL PROTECTIVE EQUIPMENT**

- As specified by the University of Otago Laboratory Rules (contained in the University of Otago HSNO Exempt Compliance Manual) a laboratory coat/overalls and closed-in shoes must be worn when handling any hazardous substance.
- Chemically resistant gloves must be worn when handling Class 6.1 compounds. The SDS for a substance should be consulted for information on the appropriate type of glove to be used.
- Where fume hoods are used these must conform to, and be used in accordance with, the standards and rules specified in the University of Otago HSNO Exempt Laboratory Compliance Manual.
- Safety Glasses **must** be worn when handling Class 6.1 substances. *Be aware that there are many activities which can result in splashing or dispersing of substance into the eyes. Examples of such activities include (but are not limited to); opening containers or tubes, adding water/liquid to a powdered substance in a beaker, vigorous mixing/vortexing, pouring and using syringes (especially to force liquids through tubing, filter cartridge, columns etc).*
- For HSNO Class 6.1 substances which are significant dermal exposure hazards (i.e. are readily absorbed through the skin) the use of additional personal protective equipment should be considered, such as the use of a face-shield (if handling the substance outside of a fume hood), PVC apron and long-cuff gloves.
- Where a laboratory user is uncertain of the appropriate personal protective equipment to use in handling a hazardous substance, the SDS should be consulted AND advice should be sought from the Laboratory Supervisor or Departmental Laboratory Manager (DLM).

#### **H. DISPOSAL**

- Waste hazardous substances must be collected and disposed of by a licensed chemical waste contractor. Contact your DLM to arrange for appropriate storage and collection of any hazardous waste.
- Empty glass or plastic containers that were used to store hazardous substances can be triple rinsed in water and disposed of in the general waste. However, all labels **must** be removed or defaced prior to disposal of empty containers. Care should also be taken to dispose of glass appropriately.

## I. SPILLS

- The correct clean-up procedure for a substance must be obtained from the SDS and any relevant SMOU **before** the substance is handled. The laboratory user must ensure they know the location of the laboratory emergency spill kit and that the spill kit contains appropriate materials for the substance being handled.
- If a spill occurs, notify any other laboratory users in the area. If the laboratory user is not able to supervise the spill (e.g. because they need to seek assistance or the emergency spill kit), then it is advisable that another laboratory user be assigned to supervise the spill site.
- Small spills (as a guideline, spills of less than 2.5L or 2.5Kg, where the associated hazards are known) should be cleaned up immediately using the laboratory emergency spill kit;
  - a) Absorbent booms can be used to contain liquid spills and prevent them spreading further, while absorbent material (such as vermiculite) can be used to soak up such spills.
  - b) Used absorbent material and/or solid substance can be transferred directly into a suitable (airtight) container which must be labelled with the identity and HSNO classifications of the spilled substance.
  - c) Contact your departmental laboratory manager for appropriate storage and disposal.
- For larger spills (as a guideline, spills of more than 2.5L or 2.5Kg) or any spill a laboratory user is unsure how to deal with, the laboratory supervisor or DLM must be contacted for assistance. Depending on the size and nature of the spill the Laboratory Supervisor or DLM may also contact the HazSub Response Team for assistance by calling Campus Security (5000) and informing them that they need assistance with a Hazardous Substances spill. Where the laboratory user is not able to contact their Laboratory Supervisor or DLM they must contact the HazSub Response Team directly for assistance. *Always contact your Laboratory Supervisor/DLM or the HazSub Response team if in any doubt as to how to handle a spill.*
- Where a spill occurs outside of a fume hood and involves a HSNO Class 6.1 substance that is associated with a significant inhalation hazard (e.g. involves a volatile toxic substance) the laboratory must be evacuated, the door closed and the DLM and/or HazSub Response Team must be notified as described above.
- Where a spill poses a significant risk to other personnel in the building (i.e. where the hazard may not be confined to the laboratory in which the spill initially occurred) the spill must be treated as an emergency. *As a guideline, any spill that causes a fire that cannot be quickly put out by the laboratory user, or which results in the release of hazardous quantities of highly toxic, flammable or oxidising gases must be treated as an emergency.*
- Where a spill is considered an emergency follow all applicable Emergency Response guidelines/plans (e.g. any Laboratory- and/or Building-specific plans). Typically, a fire alarm should be activated and the building evacuated (unless the spill involves the release of hazardous quantities of flammable gases/fumes – in which case evacuation should be carried out by word-of-mouth only, as activation of alarms or other electrical devices and switches may trigger a fire/explosion). If the spill involves a substance that is a

flammable/explosive hazard, the laboratory gas-shut-off valve should be activated and any other sources of ignition (e.g. electric elements) turned off before exiting the laboratory. From a safe place, dial 1-111 and ask for the Fire Service – inform them that a chemical spill has occurred and the substance(s) involved. Campus Security (5000) must also be notified, again informing them that a chemical spill has occurred and the identity of the substance(s) involved – Campus Security will notify the HazSub Response Team, who will liaise with the Fire Service and Building Fire Warden. Where possible, also notify the Building Fire Warden and Departmental Laboratory Manager directly.

- All injuries and incidents must be reported to the DLM.

#### **K FIRST AID**

- Laboratory users must be aware of first aid procedures when working in the laboratory and know the location of the nearest first aid facilities, the emergency eye and hand wash station and emergency shower.
- The hazards and recommended first-aid treatment in case of accidental exposure to a HSNO Class 6.1 substance must be identified from the SDS **before** the substance is handled. Specifically, the laboratory user must be aware of the hazards and appropriate first-aid treatment in the event of the substance contacting the skin or eyes, or of the substance being inhaled or ingested.
- If administering first-aid or other assistance to another laboratory user who has been exposed to a hazardous substance, or to a laboratory user you suspect of having been exposed to a hazardous substance (e.g. where an unconscious body is discovered in a laboratory) exercise caution that you do not expose yourself to the hazard and be aware that inhalation hazard(s) may be present.
- If you are unsure of the appropriate first-aid treatment or are concerned about yourself or another laboratory user who has been exposed to a hazardous substance the NZ National Poisons Centre (1-0800 POISON or 1-0800-764-766) should be contacted for advice.
- Where a laboratory user is unconscious, is having breathing difficulty or is otherwise seriously ill or injured, dial 1-111 immediately and ask for Ambulance.
- All injuries and incidents must be reported to the Departmental Laboratory Manager.

## **L WORKPLACE EXPOSURE STANDARDS**

- For many commonly used hazardous substances 'Workplace Exposure Standards (WES)' have been set by the Occupational Safety and Health Service of the NZ Department of Labour. These standards set limits to the short and long-term exposure of workers to hazardous chemicals and can be obtained from the Chemwatch database or from the NZ Department of Labour (<http://www.osh.govt.nz/order/catalogue/wes2001.shtml>). A list of some commonly used Class 6.1 substances for which exposure standards have been set is given in Appendix 4. This list is indicative only and not exhaustive.
- For laboratories where specific hazardous substances are used routinely and for which NZ WES have been set, the Departmental Laboratory Manager should be notified, who in turn will consult with the Laboratory Health and Safety Advisor (Health and Safety Compliance) as to whether environmental monitoring is appropriate.
- The absence of an exposure standard for a substance should NOT be taken to imply that the substance is 'safe'. In most cases the absence of an exposure standard will simply indicate that such a standard has yet to be set (in some cases this will be due to lack of data).

## M APPENDICES

### 1. Classification of HSNO Class 6.1 (acutely toxic) substances.

| Category | Route of Exposure and Toxicity      |                                       |  |  |  |
|----------|-------------------------------------|---------------------------------------|--|--|--|
|          | Oral LD <sub>50</sub><br>(mg/Kg bw) | Dermal LD <sub>50</sub><br>(mg/Kg bw) | Gases LC <sub>50</sub><br>(ppm in air) | Vapours LC <sub>50</sub><br>(mg/L air) | Dusts/Mists LC <sub>50</sub><br>(mg/L air) |
| 6.1A     | 5                                   | 50                                    | 100                                    | 0.5                                    | 0.05                                       |
| 6.1B     | 50                                  | 200                                   | 500                                    | 2                                      | 0.5  |
| 6.1C     | 300                                 | 1000                                  | 2500                                   | 10                                     | 1  |
| 6.1D     | 2000                                | 2000                                  | 5000                                   | 20                                     | 5  |
| 6.1E     | 5000                                |                                       |  |  |  |

### 2. Examples of HSNO Class 6.1 substances which when mixed with incompatible substances may release hazardous gases/fumes.

| HSNO Class 6.1 Substance/<br>Substance class | HSNO Class 6.1 category | Incompatible Substance                              | Hazardous Gas/Fumes Generated | Primary HSNO Hazard Class(es) of Gas/Fumes |
|--|-------------------------|---|-------------------------------|--|
| Arsenates                                    | 6.1C <sup>1</sup>       | Reducers <sup>2</sup>                               | Arsine                        | 2.1.1B, 6.1A                               |
| Azides                                       | 6.1B <sup>1</sup>       | Acids   | Hydrogen Azide                | 1.1A, 6.1B                                 |
| Cyanides                                     | 6.1A <sup>1</sup>       | Acids   | Hydrogen Cyanide              | 3.1A, 6.1A                                 |
| Formaldehyde                                 | 6.1B                    | HCl or Hypochlorite                                 | Bis-chloromethyl ether        | 3.1C, 6.1A                                 |
| Nitrates                                     | 6.1D <sup>1</sup>       | Sulfuric Acid                                       | Nitrogen dioxide              | 5.1.2A, 6.1A, 8.1A, 8.2A, 8.3A             |
| Nitrites                                     | 6.1C <sup>1</sup>       | Acids   | Nitrous oxide fumes           | 5.1.2A                                     |
| Phosphorous                                  | 6.1D <sup>1</sup>       | Caustic Alkalis <sup>3</sup> /Reducers <sup>2</sup> | Phosphine                     | 2.1.1B, 6.1A, 8.2C, 8.3A                   |
| Selenides                                    | 6.1C <sup>1</sup>       | Reducers <sup>2</sup>                               | Hydrogen Selenide             | 6.1B                                       |

<sup>1</sup> HSNO Class 6.1 category typical of substance class – actual 6.1 category may vary for specific members of substance class.

<sup>2</sup> for example Hydrazine,

<sup>3</sup> for example Sodium Hydroxide



**3. GHS, UN and Tracked Substance Pictograms for HSNO Class 6.1 substances**

**GHS Pictogram**



**UN Pictogram**



**Tracked Substance Pictogram**



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HSNO Class 6.1 Acutely Toxic (Solids, liquids)

**4. Examples of HSNO Class 6.1 substances for which New Zealand Workplace Exposure Standards (WES) have been set**

| Substance                            | CAS #     | HSNO 6.1 Category | Other HSNO Classifications   | WES-TWA <sup>a</sup> (ppm) | WES-TWA <sup>a</sup> (mg/m <sup>3</sup> ) | WES-STEL <sup>b</sup> (ppm) | WES-STEL <sup>b</sup> (mg/m <sup>3</sup> ) | WES-Ceiling <sup>c</sup> (ppm) | WES-Ceiling <sup>c</sup> (mg/m <sup>3</sup> ) |
|--------------------------------------|-----------|-------------------|--|----------------------------|---|-----------------------------|--|--------------------------------|---|
| Acetic acid                          | 64-19-7   | 6.1D              | 3.1C 6.9B 8.1A<br>8.2B 8.3A 9.1D<br>9.3C                                       | 10                         | 25  | 15                          | 37   |                                |   |
| Acetone                              | 67-64-1   | 6.1E              | 3.1B 6.3B 6.4A   | 500                        | 1185                                      | 1000                        | 2375                                       |                                |   |
| Acetonitrile                         | 75-05-8   | 6.1B              | 3.1B 6.4A 9.2D<br>9.3A   | 40                         | 67  | 60                          | 101  |                                |   |
| Acrylamide                           | 79-06-1   | 6.1C              | 6.3A 6.4A 6.5B<br>6.6A 6.7A 6.8B<br>6.9A 9.3B                                  |                            | 0.03                                      |                             |  |                                |   |
| Ammonia                              | 1336-21-6 | 6.1B              | 6.1B 6.1D 8.1A<br>8.2C 8.3A 9.1A   | 25                         | 17  | 35                          | 24   |                                |   |
| Arsenates (e.g .<br>Sodium Arsenate) | 7631-89-2 | 6.1C              | 6.3B 6.5B 6.7A<br>9.1A   |                            | 0.05                                      |                             |  |                                |   |
| Butanol                              | 71-36-3   | 6.1D              | 3.1C 6.3A 8.3A<br>9.3C   |                            |   |                             |  | 50                             | 150   |
| Chloroform                           | 67-66-3   | 6.1D              | 6.3A 6.4A 6.7B<br>6.8B 6.9A 9.1D<br>9.3B                                       | 2                          | 9.9                                       |                             |  |                                |   |
| Chromium (VI)<br>Oxide               | 1333-82-0 | 6.1B              | 5.1.1B 6.5A<br>6.5B 6.6A 6.7A<br>6.8A 6.9A 8.1A<br>8.2B 8.3A 9.1A<br>9.2B 9.3B |                            | 0.05                                      |                             |  |                                |   |

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HSNO Class 6.1 Acutely Toxic (Solids, liquids)

| Substance                         | CAS #     | HSNO 6.1 Category | Other HSNO Classifications                                 | WES-TWA <sup>a</sup> (ppm) | WES-TWA <sup>a</sup> (mg/m <sup>3</sup> ) | WES-STEL <sup>b</sup> (ppm) | WES-STEL <sup>b</sup> (mg/m <sup>3</sup> ) | WES-Ceiling <sup>c</sup> (ppm) | WES-Ceiling <sup>c</sup> (mg/m <sup>3</sup> ) |
|-----------------------------------|-----------|-------------------|--|----------------------------|---|-----------------------------|--|--------------------------------|---|
| Cyanides (e.g. Potassium cyanide) | 151-50-8  | 6.1A              | 6.3B 6.4A 6.5B<br>6.8B 6.9A 8.1A<br>9.1A 9.2A 9.3A<br>9.4A |                            | 5   |                             |  |                                |   |
| Dichloromethane                   | 75-09-02  | 6.1D              | 6.3A 6.4A 6.7B<br>6.8A                                     | 50                         | 174                                       |                             |  |                                |   |
| Dimethyl formamide                | 68-12-2   | 6.1D              | 3.1C 6.3B 6.4A<br>6.8A 6.9A 9.3C                           | 10                         | 30  |                             |  |                                |   |
| Ether                             | 60-29-7   | 6.1D              | 3.1A 6.3B 6.4A<br>9.3C                                     | 400                        | 1210                                      | 500                         | 1520                                       |                                |   |
| Formaldehyde                      | 50-00-0   | 6.1B              | 3.1D 6.5B 6.6B<br>6.7A 6.9B 8.2C<br>8.3A 9.1D 9.2A<br>9.3B |                            |   |                             |  | 1                              | 1.2   |
| Glutaraldehyde                    | 111-30-8  | 6.1A              | 6.5A 6.5B 6.9B<br>8.2B 8.3A 9.1A<br>9.2A 9.3A              |                            |   | 0.05                        |  |                                |   |
| Hexane                            | 110-54-3  | 6.1E              | 3.1B 6.3B 6.4A<br>6.9A 9.1B                                | 20                         | 72  |                             |  |                                |   |
| Hydrogen Peroxide                 | 7722-84-1 | 6.1D              | 5.1.1A 6.9B<br>8.2A 8.3A 9.1D<br>9.3B                      | 1                          | 1.4                                       |                             |  |                                |   |
| Isopropanol                       | 67-63-0   | 6.1E              | 3.1B 6.3B 6.4A   | 400                        | 983                                       | 500                         | 1230                                       |                                |   |
| Mercury (Hg) vapour               | 7439-97-6 | 6.1B              | 6.5B 6.8A 6.9A<br>8.1A 9.1A 9.2B<br>9.3A                   |                            | 0.025                                     |                             |  |                                |   |

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| Substance           | CAS #      | HSNO 6.1 Category | Other HSNO Classifications                    | WES-TWA <sup>a</sup> (ppm) | WES-TWA <sup>a</sup> (mg/m <sup>3</sup> ) | WES-STEL <sup>b</sup> (ppm) | WES-STEL <sup>b</sup> (mg/m <sup>3</sup> ) | WES-Ceiling <sup>c</sup> (ppm) | WES-Ceiling <sup>c</sup> (mg/m <sup>3</sup> ) |
|---------------------|------------|-------------------|---|----------------------------|---|-----------------------------|--|--------------------------------|---|
| Methanol            | 67-56-1    | 6.1D              | 3.1B 6.4A 6.8B<br>6.9A 9.3C                   | 200                        | 262                                       | 250                         | 328  |                                |   |
| Methyl methacrylate | 80-62-6    | 6.1D              | 3.1B 6.3B 6.4A<br>6.5B 6.9B 9.1D              | 50                         | 208                                       | 100                         | 416  |                                |   |
| Phenol              | 108-95-2   | 6.1B              | 6.6A 6.8B 6.9A<br>8.2B 8.3A 9.1D<br>9.2D 9.3B | 5                          | 19  |                             |  |                                |   |
| Selenium            | 7782-49-2  | 6.1C              | 6.9B 9.1A                                     |                            | 0.1                                       |                             |  |                                |   |
| Sodium Azide        | 26628-22-8 | 6.1B              | 9.1A 9.3A                                     |                            |   |                             |  | 0.11                           | 0.29  |
| Sodium Hydroxide    | 1310-73-2  | 6.1D              | 6.1D 8.1A 8.2B<br>8.3A 9.1D 9.3C              |                            |   |                             |  |                                | 2   |
| Toluene             | 108-88-3   | 6.1D              | 3.1B 6.1D 6.3A<br>6.4A 6.8B 6.9B<br>9.1D 9.3C | 50                         | 188                                       |                             |  |                                |   |
| Xylene              | 1330-20-7  | 6.1D              | 3.1C 6.3A 6.4A<br>6.8B 6.9B 9.1D<br>9.3C      | 50                         | 217                                       |                             |  |                                |   |

- a** Workplace Exposure Standard – Time Weighted Average (WES-TWA): This is the average concentration of substance that should not be exceeded over an 8 hour work shift.
- b** Workplace Exposure Standard – Short-Term Exposure Limit (WES-STEL): This is the average concentration of substance that should not be exceeded over any 15 minute period.
- c** Workplace Exposure Standard – Ceiling (WES-Ceiling): This is the concentration of substance that should not be exceeded during any part of the working day.

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