Chemical Risk Management Protocol

Safe Methods of Use (SMOU)

Class 5.1 Oxidisers

Document Owner: Associate Director, Health, Safety and Wellbeing
Content Manager: Manager, Hazard and Containment
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Table of Contents

1 Purpose

This Safe Method of Use (SMOU) applies to principal investigators (PIs), laboratory managers, designated laboratory persons (DLPs), and all staff and students who direct or participate in the use of Class 5.1 oxidising chemicals at the University of Auckland.

2 Disclaimer

The Safety Data Sheet (SDS) should be consulted for specific information about the chemical you will be using. The Gold FFX SDS Database is available on the Library database. Instructions on how to source this information can be found on the Health, Safety and Wellbeing Databases website:

https://www.auckland.ac.nz/en/health-safety-wellbeing/health-safety-topics/laboratory-safety/chemical-safety/databases.html

Please read this SMOU in conjunction with the Chemical Risk Management Guidelines.

Note: 'Shall' denotes a mandatory requirement and 'should' denotes a recommendation.

3 Classification

This SMOU covers the use of UN Class 5.1 oxidisers. In the other chemical classification systems of NZ, this includes:

HSNO Class	Corresponding GHS 7 Class
5.1.1 A-C	Oxidising liquids Category 1 or Oxidising solids Category 1
5.1.2 A	Oxidising gases Category 1

4 Storage

Class 5.1 compounds shall NOT be stored with Class 2 Flammable Gases or Aerosols, Class 3 Flammable Liquids, Class 4 Reactive Chemicals or Class 5.2 Organic Peroxides.

Store separately from any combustible organic compound - preferably store in an oxidisers cabinet or separate metal cabinet. Strong oxidisers such as metal peroxides, perchlorates and nitrates react violently with combustible organic compounds such as alcohols, aldehydes, ethers, and hydrocarbons.

Segregation may also be provided for single containers by storage inside a segregation device (such as a sealable plastic box).

Oxidising acids (e.g. nitric acid and perchloric acid) shall not be stored with flammable acids (e.g. acetic acid and formic acid)

5 Use

- Ensure that these chemicals are used well away from low flash point solvents or any fine ground organic compound.
- These chemicals often have a strong corrosive action and shall be used in a fume hood.
- Safety glasses shall be worn when handling these chemicals
- Perchloric acid digestions shall be conducted only in fume hoods which have ducting certified for work with perchlorates.
- Care should be taken when using strong oxidising agents such as metal peroxides, perchlorates and nitrates and concentrated nitric acid as these chemicals can react violently with combustible organic compounds.

6 Disposal

- Oxidiser waste shall not be combined with waste of incompatible chemicals including Class 3 Flammable Liquids, Class 4 Reactive Solids or Class 5.2 Organic Peroxides.
- Disposal of Class 5.1 chemicals shall be undertaken by a licensed chemical waste contractor.
- Class 5.1 chemicals shall be packed separately for disposal.
- Please contact the Chemical Safety Advisor for advice on disposal.

7 Spills

Refer to the Chemical Risk Management Protocol Guideline "2. Using Chemicals" section 11 and the specific SDS for full spill response instructions.

- Use correct gloves
- If liquid, use absorbent material in spill kits to wipe up – wiping from outside of spill toward centre.
- Place used absorbent material in impermeable/airtight container
- Solids can be placed directly impermeable/airtight container
- Inform Laboratory Manager and arrange for immediate disposal

Appendix 1: A Representative List of Oxidising Chemicals

Note this is not an exhaustive list. Consult the SDS for detailed classification.

Bromates		
Potassium bromate	Sodium bromate	
Dichromates		
Ammonium dichromate	Potassium dichromate	Sodium dichromate
Nitrates		
Aluminium nitrate	Ammonium nitrate	Ammonium nitrate fertilisers
Barium nitrate	Bismuth nitrate	Cadmium nitrate
Calcium nitrate	Cerium (III) nitrate	Chromium nitrate
Cobalt nitrate	Copper nitrate	Ferric nitrate
Lanthanum nitrate	Lead nitrate	Lithium nitrate
Magnesium nitrate	Manganese nitrate	Nickel nitrate
Potassium nitrate	Silver nitrate	Sodium nitrate
Strontium nitrate	Zinc nitrate	Zirconium nitrate
Persulphates		
Ammonium persulphate	Potassium persulphate	
Perborates		
Potassium perborate	Sodium peroxoborate	
Perchlorates, chlorates and chlorites		
Barium perchlorate	Lead perchlorate	Magnesium perchlorate
Perchloric acid	Potassium chlorate	Sodium chlorate
Sodium chlorite	Sodium perchlorate	
Hypochlorites		
Calcium hypochlorite	Sodium hypochlorite	
Iodates and Periodates		
Calcium iodate	Periodic Acid	Potassium periodate
Sodium periodate		
Oxides and Peroxides		
Barium peroxide	Calcium peroxide	Chromium trioxide (anhydrous)
Hydrogen peroxide	Lead dioxide	Potassium superoxide
Silver oxide	Sodium peroxide	Urea hydrogen peroxide

Miscellaneous		
Dichloroisocyanuric acid	Trichloroisocyanuric acid	Bismuth oxynitrate
Cerium (IV) sulphate	Potassium permanganate	Sodium percarbonate
Sodium permanganate	Sodium persulphate	
Oxidising Acids		
Perchloric acid	Periodic acid	
Concentrated Sulphuric acid	Concentrated Nitric acid	Chromic acid
Nitrites		
Potassium nitrite	Sodium nitrite	