| UNIVERSITY OF CAMBRIDGE | Department: Materials Science | Location: Teaching Labs |
|---|---|---|
| | Date: 20/11/2025 | Assessment Reference: |

# HAZARDOUS SUBSTANCE RISK ASSESSMENT FORM

This document fulfils the requirements of the COSHH and DSEAR Regulations relating to a written risk assessment

********* **WHEN COMPLETING THE FORM REFER TO GUIDANCE NOTES ON SAFETY OFFICE WEBSITE** **********

**Experiment / Procedure / Process / Activity / Demonstration** (include a brief description)**:**

Weigh out coarse powder form of the following metals: Fe, Cr, Mo, Ni for the purpose of melting as the first stage of the Part II Alloy Design Project.

**Frequency** (hourly, daily, weekly, monthly or 'one-off')**:** one-off

**Hazardous substances to be used** (List *ALL* substances including solvents, expected products and by-products)**:**

Can any of the substances be substituted with a less hazardous substance or form of the substance? ~~YES~~ / NO

**If yes**, you must do so, or justify not using it. _____

| **Substance** | **Approx. quantity** | **Physical Form** gas, liquid, solid, dust | **Hazards** Toxic, flammable, corrosive, irritant, easily absorbed through skin etc | **WEL** Work Place Exp Limit | **Risk Phrases / GHS Hazard Statements** (see guidance note lists) | **Potential Exposure Route(s)** inhalation, ingestion, injection, absorption |
|---|---|---|---|---|---|---|
| Iron | 26g | Flake | Minimal toxicity, dust may cause mechanical irritation to eyes / skin | None established | H335 – May cause respiratory irritation (dust) | Skin contact |
| Chromium | 15g | Coarse Powder | Toxic if inhaled, irritant, some forms are carcinogenic | 0.5 mg/m^3 | H331 – Toxic if inhaled.<br>H315 – Causes skin irritation.<br>H351 – Suspected of causing cancer | Inhalation / skin spillage |
| Nickel | 5g | Coarse Powder | Carcinogen, skin sensitiser, respiratory sensitiser | 0.1 mg/m^3 | H351 – Suspected of causing cancer.<br>H317 – May cause allergic skin reaction.<br>H372 – Causes organ damage through prolonged exposure. | Inhalation / skin spillage |
| Molybdenum | 4g | Coarse Powder | Low toxicity, dust may cause irritation | 10 mg/m^3 | H335 – May cause respiratory irritation | Inhalation / skin spillage |

**Which are the significant chemical hazards?** Inhalation of metal dust (particularly Ni and Cr), skin causing irritation or sensitisation and potential carcinogenic effects of powders.

**Assessment Reference:**

**Risks associated with the procedure:** (non-chemical risks require additional risk assessment- see saftey office website}

Manual handline of small masses of metal powders, potential for dust formation during weighing, accidental skin contact or inhalation if powders are disturbed, minor risk of spillage.

Note: DSEAR risk considerations include:

Is there any substance used or formed that might give rise to a fire or explosion (e.g. reactive intermediates)? ☐ ~~y~~/n

**If yes**, how will you ensure that no fire or explosion occurs (inc. the consideration of eliminating ignition sources):

Is it reasonably foreseeable that the lower explosive limit (LEL) will be reached in the room or area of the work? ☐ ~~y~~/n

**If yes**, a more detailed risk assessment may be required under the Dangerous Substances Explosive Atmospheres Regulations.

**For further guidance on DSEAR see HSD073C and the DSEAR risk assessment form HSD080C**

**Are any of the substances a Category 1 or 2 carcinogen, a mutagen, a substance toxic to reproduction, a respiratory sensitizer or a skin sensitizer?** ☐ y/~~n~~

(Hazard Statements:H317,H351)

Work with these compounds must be carried out in a fume cupboard where reasonably practicable. A health record must be completed.

**Control Measures:**

***Containment**:*

Fume cupboard ☐ Y

Glove box / isolator ☐

Safety cabinet ☐

Local exhaust ventilation ☐ Y

***Additional:***

Storage requirements (specify): Keep metal powders in sealed labelled containers when not in use

Other control measure (specify): Keep dry and away from acids and oxidisers

Is health surveillance required? y/~~n~~ ☐ Y

*Personal Protective Equipment:*

Lab coat / overalls ☐ Y

Gloves ☐ Y

Glove type: Nitrile / Neoprene

Eye Protection (i.e. safety glasses, goggles, face shield) ☐ Y

type: Safety glasses / goggles

Respiratory protective equipment (RPE) * ☐ N

RPE type: _____

*** Under COSHH all RPE requires face-fit testing**

**Monitoring:** Gas, Vapour or Dust N ☐ Specify what and how : _____

**Are any additional controls required not covered above?** (training, instruction, information or maintenance)

**Are there additional non-chemical hazards requiring further risk assessment? ~~y~~/n N ☐ Ref No:**

**Waste Disposal Routes:** Refer to University and departmental policy.

Consider segregation, containment and appropriate labelling of waste in order to avoid problems of mixing incompatible wastes.

Chlorinated solvent ☐

Non-chlorinated solvent ☐

Aqueous (hazardous) ☐

Aqueous (non-hazardous) ☐

Other (specify): Label as "Metal Waste – Ni/Cr-containing" and place in hazardous waste disposal

Identify incompatible wastes: _____Acids, oxidisers_____

**Assessment Reference:**

**NB: The mixing of incompatible wastes can introduce significant additional hazards, consult literature and MSDSs**

**Emergency Procedures** (emphasise any special hazards)**:**

Fire Extinguisher: C $O_2$ N ☐ ☐ Dry Powder Y ☐ ☐ L2 D-metal ☐ ☐

Spillage/Uncontrolled Release: Spill Kit, Use metal dust spill kit, avoid dry sweeping, damp wipe, evacuate if airborne dust. Evacuate Area Wash Down Area

Other (specify): _____

What could happen if there was catastrophic failure of the apparatus? _____Not applicable_____

In the event of an accident, who might be exposed? _____Students performing the experiment_____

**Emergency Treatment in Case of Contamination or Exposure:**

**Exposure/Contamination – standard procedures** (special procedures MUST be detailed below) **Read and Understood** **Y** ☐

**Mouth, Eyes, Skin Exposure** – flush area of contact with plenty of water, contact a First Aider; **Lungs** – remove to fresh air, contact a First Aider.

**If swallowed** – contact a First Aider, get details of substance ingested and seek medical attention immediately.

**If casualty unconscious** – contact a First Aider immediately and call an ambulance.

Other (specify): _N/A_____

**It is agreed that application of the control measures specified will provide adequate management of the identified risks.**

**Name of assessor: Thomas Fish**

**Signature:**  **Date:** 20/11/2025

**Name of co-signatory:** (e.g. Supervisor / authorised deputy)

**Signature:** **Date:**

**Note: This risk assessment is valid for one year after which time it MUST be reviewed.**