****

**SCHOOL OF ENGINEERING**

**RISK ASSESSMENT FOR AN ACTIVITY INVOLVING THE USE OF HAZARDOUS CHEMICALS as required under the Control of Substances Hazardous to Health (COSHH) Regulations**

|  |
| --- |
| **PROCEDURE:**   * **Assessor to complete risk assessment in consultation with PI/supervisor and technical staff as appropriate.** * **PI/supervisor to review risk assessment, check that the identified control measures are in place, approve the assessment, and sign form.** * **The PI/supervisor to forward the original or a scanned copy of the signed document to the Local Safety Coordinator.** * **A copy to be given to each individual carrying out the work.**   **NOTES:**   * **No work involving hazardous materials is to commence without a COSHH form signed by the PI/supervisor.** * **The Local Safety Coordinator, Lab Coordinator, or technical staff may stop work if no risk assessment is in place or if, in their opinion, there is a risk to safety.** * **Examples of how to complete this form are available at** [**www.hse.gov.uk/risk/casestudies/**](http://www.hse.gov.uk/risk/casestudies/) . * **PIs/supervisors must consult the Local Safety Coordinator prior to authorizing any work involving the use of nanomaterials.** * **All persons carrying out work that requires respiratory protective equipment (RPE) must undergo Face Face-Fit Testing before they undertake any work.**   **PI/SUPERVISOR RESPONSIBILITIES:**   * **PIs/supervisors must ensure that COSHH assessments have been completed for all workplace activities that use or create hazardous materials.** * **PIs/supervisors must ensure that the stated control measures are used, maintained, and reviewed as necessary.** * **PIs/supervisors must ensure that COSHH forms are reviewed and revised as appropriate when any changes are made to the equipment, materials, procedure, or personnel, or the results of monitoring exposure shows it to be necessary.** * **PIs/supervisors must provide staff, research students, project students, and visitors with, or arrange the provision of, suitable and sufficient information, instruction, and training which should include:**    + **the names of the substances they work with or could be exposed to, and the risks created by such exposure;**   + **access to safety data sheets that apply to those substances;**   + **relevant COSHH forms;**   + **precautions they should take;**   + **control measures, their purpose, and how to use them**   + **PPE;**   + **results of exposure monitoring and health surveillance;**   + **emergency procedures.** |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Classification (indicate the category of danger): To be completed by person responsible for this work (PI)** | | | | | | | | | | | |
|  | **√** |  | **√** |  | **√** |  | **√** |  | **√** |  | **√** |
| **acute toxicity** |  | **health hazard** |  | **Flammable** |  | **Hazardous to environment** |  | **Oxidising** |  | **Corrosive** |  |
| **serious health hazard** |  | **Explosive** |  | **Gas under pressure** |  |  |  |  |  | **Biological** |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Person responsible for this work (PI)** | | | | |
| **Name** | **Position** | **Email** | **School** | **Signature + date** |
|  | | | | |
| **Person carrying out the assessment** | | | | |
| **Name** | **Position** | **Email** | **School** | **Signature + date** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Person carrying out the work** | | | |
| **Name** | **Position** | **Email** | **Signature** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |
| --- |
| **A. Description of activity / experiment** |
| ***Material preparation****.*  ***Experiment***  ***Storage****.*  ***Waste disposal****.* |

|  |  |  |
| --- | --- | --- |
| **B. Location** | | |
| **School** | **Building** | **Room** |
| Engineering |  |  |

|  |
| --- |
| **C. Hazard and Risks** |
| **C.1 Hazard evaluation and risk determination** (Relevant SDS section: Sections 1, 2, 4, 8, 13, 16) |
| List each of the chemical substances used in the activity in the appropriate table below.  For substances other than nanomaterials, use the matrix in Appendix A to determine the risk level for each one. Include CAS number if likely to be confused with other chemicals.  Hazard statements (previously risk phrases) are reported in Safety Data Sheets (SDS). If a chemical has more than one hazard statement, use the one(s) with the highest health hazard to determine the risk level.  *Waste disposal method*: drain, specialist contractor, return to distributor/manufacturer, other (specify).  *Possible routes of exposure*: Eye splash (Es), skin contact (Sk), inhalation (In), ingestion (Ig), other (state).  *Workplace Exposure Limit (WEL)*: Usually in ppm for vapors or mg/m3 for particulates. A full list of WELs can be found at <http://www.hse.gov.uk/pubns/books/eh40.htm> . |

**NANOMATERIALS**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substance** | **waste disposal method** | **Route of exposure** | **Hazard Statement(s) / Risk Phrase(s)** | **Workplace Exposure Limits (WELs)** | **nature of hazard[[1]](#footnote-1)** | **physical state[[2]](#footnote-2)** | **Quantity[[3]](#footnote-3)** | **frequency/duration of use[[4]](#footnote-4)** | **control measures in use[[5]](#footnote-5)** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**ALL OTHER SUBSTANCES**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Substance** | **waste disposal method** | **Route of exposure** | **Hazard Statement(s)/Risk Phrase(s) (see safety data sheet)** | **Workplace Exposure Limits (WELs; see safety data sheet)** | **Health Hazard Score** | **Dustiness / Volatility Score** | **Quantity[[6]](#footnote-6) : amount (score)** | **Overall risk level**  **L/M/H** |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

|  |
| --- |
| **C.2 Process factors influencing the risk of exposure** |
| |  | | --- | | **Are there any process factors that influence the route of exposure?** | | Weighing **[ ]** Pipetting **[ ]** Filtering **[ ]** Elevated Temperature **[ ]**  Shaking/Mixing **[ ]** Centrifugation **[ ]** Use of sharps **[ ]** High Pressure **[ ]**  Others: | |
| **C.3 Identification of those at risk of exposure** (Relevant SDS section: Section 2) |
| 1. Are there any substances listed in this activity having the hazard statements H360, H360FD, H360Df, H361, H361d, H360Fd, H362 (formerly risk phrases R61, 63 or 64), i.e., those affecting women of child-bearing age? **YES [ ] NO [ ]**   **If yes,** this risk assessment once completed, must be submitted to the School Safety Adviser for review before work is carried out.   1. Are there any substances listed in this activity having the hazard statements H334 (formerly risk phrase R42), H317 (R43), H350 (R45), H340 (R46), H373, H372 (R48), and H350i (R49) AND have been determined to in the high risk category using the matrix above? **YES [ ] NO [ ]**   **If yes,** this risk assessment once completed, must be submitted to the Local Safety Coordinator for review before work is carried out.  If ‘yes’ is answered to either of the above question, indicate the frequency and duration of use   * **frequency** (daily, weekly, monthly): * **duration** (five minutes, one hour, one day):  1. Are there any external factors that increase the risks associated with exposure to any of these substances, e.g., contact lens wearing? **YES [ ] NO [ ]**   **If yes,** give details:   1. Are there any personnel other than laboratory workers who may be at risk from exposure? (e.g., maintenance workers, cleaners)? **YES [ ] NO [ ]**   **If yes**, give details: |
| **C.4 Substances subject to other legislation** (Relevant SDS section: Sections 2, 16) |
| Are there any substances involved in this activity that are subject to either the Chemical Weapons Act or the Anti-terrorism, Crime and Security Act? **YES [ ] NO [ ]**  **If yes,** give details:  Are there any substances involved in this activity that are listed by the Home Office as drug precursors?  **YES [ ] NO [ ]**  **If yes,** give details:  Are there any substances involved in this activity that are defined as controlled drugs?  **YES [ ] NO [ ]**  **If yes,** give details:  Are there any substances involved in this activity that are explosive, flammable, or oxidizing?  **YES [ ] NO [ ]**  **If yes,** give details:  Controlled drugs list: <http://www.drugs.gov.uk/publication-search/drug-licences/precursor-list>  Chemical Weapons Act:<http://www.opsi.gov.uk/Acts/acts1996/ukpga_19960006_en_1>  Anti-terrorism, Crime and Security Act:<http://www.opsi.gov.uk/acts/acts2001/10024-ac.htm>  Dangerous Substances and Explosive Atmospheres Relations 2002 (DSEAR) <http://www.hse.gov.uk/fireandexplosion/dsear-regulations.htm> |

|  |
| --- |
| **D. Control measures – prevention of exposure** |
| **Elimination, substitution and procedural change**   1. Can any of the substances be eliminated from the process? **YES [ ] NO [ ]**   **If yes,** give details:   1. Can any of the substances be substituted by a safer alternative or a safer form of the same substance?   **YES [ ] NO [ ]**  **If yes,** give details:   1. Can the method of work be changed so that the operation giving risk to exposure is no longer necessary? **YES [ ] NO [ ]**   **If yes,** give details:   1. Are measures in place to exclude non-essential personnel from the area?   **YES [ ] NO [ ]**  **If yes,** give details: |

|  |
| --- |
| **E. Control measures -- control of exposure** (Relevant SDS section: Sections 7, 8) |
| **E.1 Minimizing quantities**  Can the quantities of the substance stored, used, and produced as waste be reduced?  **YES [ ] NO [ ]**  **If yes,** give details:  **E.2 Containment and ventilation**   1. Can some or all parts of the process be carried out on the open bench with good general ventilation?   **YES [ ] NO [ ]**  If additional containment such as drip trays are required, give details:   1. Is a fume cupboard or other form of local exhaust ventilation required for any part of the process?   **YES [ ] NO [ ]**  **If yes,** give details including type and location:   1. Is the fume cupboard or other form of local exhaust ventilation subject to a maintenance regime?   **YES [ ] NO [ ]**  **If yes,** give date of last test and state who is responsible for organizing maintenance:   1. Does any part of the process need to be totally enclosed, e.g., inside a glove box?   **YES [ ] NO [ ]**  **If yes,** give details:   1. Do measures need to be taken to control sources of ignition?   **YES [ ] NO [ ]**  **If yes,** give details:   1. Is a chemical spill kit required?   **YES [ ] NO [ ]**  **If yes,** give details:  **E.3 Storage**  Toxic **[ ]** Corrosive **[ ]**  Flammable/highly flammable/extremely flammable **[ ]** Other **[ ]**  **E.4 Personal protective equipment (PPE)**   |  |  |  |  | | --- | --- | --- | --- | |  | **Yes /No** | **Type** | **During which parts of the process is PPE required (e.g., experimental process or emergencies only)?** | | **Gloves** |  |  |  | | **Eye protection** |  |  |  | | **Clothing** |  |  |  | | **Respiratory protection**[[7]](#footnote-7), [[8]](#footnote-8) |  |  |  | | **Other (specify)** |  |  |  |   **E.5 Hygiene measures**  Describe the hygiene measures in place for work involving these substances:   |  |  | | --- | --- | |  |  | | **Hand washing facilities** |  | | **Laundering of PPE** |  | | **Storage of personal clothing** |  | | **Prohibition of eating and drinking** |  | | **Other (specify)** |  |   **E.6 Exposure monitoring and health surveillance**  Is monitoring of exposure necessary to validate the efficacy of control measures for any of these substances?  **YES [ ] NO [ ]**  **If yes,** give details:  Is health surveillance required?  **YES [ ] NO [ ]**  **If yes,** give details:  **E.7 Information, instruction, training, and supervision**  List specialized supervision and/or training requirements for those working with these substances, if any:   |  |  |  | | --- | --- | --- | | **Training details** | **Frequency of training** | **How records will be kept** | |  |  |  | |  |  |  | |  |  |  |   **E.8 Additional controls**  Are there any additional controls required in relation to the process factors identified in section C.2 that are not covered anywhere else?   |  |  |  | | --- | --- | --- | | **Process** | **Exposure route** | **Description of how exposure is controlled** | | Weighing |  |  | | Pipetting |  |  | | Filtering |  |  | | Elevated temperature |  |  | | Shaking/mixing |  |  | | Centrifugation |  |  | | Use of sharps |  |  | | High pressure |  |  | | Other |  |  | |

|  |
| --- |
| **F. Transportation** |
| **F.1 Within the building**  Will any of these substances need to be transported to other parts of the building or other parts of the site?  **YES [ ] NO [ ]**  **If yes,** give details of containment arrangements/precautions:  **F.2 Outwith the building.**  Will any of these substances need to be transported to other sites?  **YES [ ] NO [ ]**  **If yes,** give name of other site:  substance and quantity:  method of transport proposed:  containment precautions: |

|  |
| --- |
| **G. Emergency procedures** (Relevant SDS section: Sections 4, 5, 6) |
| **G.1 Spillage or release**  Describe the procedures in place for a spillage/release:   |  |  | | --- | --- | |  | **Where?** | | **Within the laboratory but outside any primary containment facility such as glove box, fume cupboard** |  | | **Within a fume cupboard or glove box** |  | | **Outside the laboratory, e.g., en route to another part of the building/site** |  | | **Other (specify)** |  |   **G.2 First aid**  Describe the local first aid arrangements that are in place for accidental exposure to any of the substances identified above:   |  |  | | --- | --- | |  | **Where?** | | **Mains-fed eye wash** |  | | **Other type of eyewash** |  | | **Shower** |  | | **First aid kit** | **FN068** | | **Other (specify)** |  |   **G.3 Fire procedure**  Describe the procedures in place in the case of fire: |

|  |  |  |  |
| --- | --- | --- | --- |
| **Record of review.** *This COSHH risk assessment should be reviewed at least once a year. Note if changes are made to the risk assessment or the assessed activity is no longer undertaken.* | | | |
| **Name** | **Position** | **Signature** | **Date** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Created: 1st Mar 2017 (issue 1). Revised: June 2018 (issue 2). Revised: Mar 2019 (issue 3) – record of review table appended. Revised: 4 Mar 2020 (issue 4). Revised: 24 June 2021 (issue 5) – pictogram labels updated. Revised: 20 April 2023 (issue 6) – PI/supervisor to now forward signed form to LSC.

1. Carcinogen, mutagen, substance toxic to reproduction, respiratory sensitizer, skin sensitizer, or “nanomaterial of unknown toxicity”. [↑](#footnote-ref-1)
2. Powder, liquid, solid. Includes free nanomaterials, nanomaterials in liquid suspension, or nanomaterials in a solid matrix. [↑](#footnote-ref-2)
3. Include amounts and units. [↑](#footnote-ref-3)
4. Daily, weekly, monthly, rarely. [↑](#footnote-ref-4)
5. Fume cupboard, laminar flow bench, local exhaust ventilation (LEV), glove box or other form of containment, personal protective equipment (please specify). [↑](#footnote-ref-5)
6. Specify both amount and units (e.g., 15 g) and the quantity score as calculated using Appendix A. [↑](#footnote-ref-6)
7. ALL users must make an appointment with a School Face-Fit Tester prior to undertaking any activity that requires the use of respiratory protective equipment (masks, dust masks, etc.). [↑](#footnote-ref-7)
8. Specify type, manufacturer, model, disposable/non-disposable. [↑](#footnote-ref-8)