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| **1. PERSON CARRYING OUT ASSESSMENT** | | | | | | | |
| Name |  | | Position |  | | Date |  |
| **2. LOCATION** | | | | | | | |
| Campus |  | | Building |  | | Room |  |
| **3. DESCRIPTION OF ACTIVITY**  Include storage, transport and disposal if relevant. You should describe the procedure step by step, or you may attach a Standard Operating Procedure (SOP) | | | | | | | |
| PLEASE NOTE: under the CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS (COSHH) and the DANGEROUS SUBSTANCES AND EXPLOSIVE ATMOSPHERES REGULATIONS (DSEAR) you must fill in all of the relevant sections starting from 5.1 below. However, ALL hazards and their controls should be described below. Any work involving biological agents (e.g., human or animal tissues and cells) or genetically modified microorganisms (GMM) will also require a BIO1 form to be completed; further guidance can be found on the [Safety Department website](https://www.imperial.ac.uk/safety/safety-by-topic/laboratory-safety/chemical-safety/risk-assessment-for-hazardous-chemicals/) or seek advice from a Faculty Safety Advisor. Any linked forms should be referenced in section 5.5.  It is the responsibility of the person directing the research i.e. the Principal Investigator to ensure that risk assessments are carried out, remain valid and that the control measures identified are applied, taking in to consideration that many students may be carrying out a protocol or different protocols simultaneously and this may affect e.g., control or emergency measures. All assessors should complete the Imperial College Risk Assessment Foundation Training (RAFT) course. | | | | | | | |
| **4. HAZARD SUMMARY** | | | | | | | |
| Accessibility | |  | | | Manual handling |  | |
| Biological | |  | | | Noise |  | |
| Hazardous Substances (e.g., chemical) | |  | | | Trip hazards |  | |
| Electrical or Mechanical | |  | | | Other |  | |
| Lasers | |  | | | Lone working | Note, students are not permitted to lone work under any circumstances | |
| **4.1 Who might be harmed and how?** | | | | | | | |
| Staff / students | |  | | | Cleaners, engineers |  | |
| Support staff | |  | | | Other |  | |

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| **5. CHEMICAL HAZARD EVALUATION & RISK DETERMINATION** | | | |
| List each of the chemical substances used in the activity or procedure in the table in section 5.1 below and use this matrix to determine the risk level for each one. Add more rows as required | | | |
| (A)  Health Hazard | (B)  Dustiness or \*Volatility | (C)  \*\*Quantity | Score |
| LOW  Hazard Statements:  H303; 305  H313; 315; 316  H320; H336  EUH066 | LOW  Solids: Pellet-like solids that do not break up. Little or no dust observed during use. Solids forming large crystals  Liquids: Boiling point > 150oC | SMALL  <1g (ml) | 1 |
| MEDIUM  Hazard Statements:  H301; H302; H304  H311; H312; H314; H317; H318; H319  H332; H335  H371; H373 | MEDIUM  Solids: Smaller crystalline or granular solids. Minimal dust, or if any dust is seen it settles out quickly.  Liquids: Boiling point between 50 and 150oC | MEDIUM  1 to 100g (ml) | 2 |
| HIGH  Hazard Statements:  H300; H310  H330; H331; H334  H340; H341  H350; H351  H360; H361; H362  H370; H372  EUH070 | HIGH  Solids: Fine, light powders. Dust can be seen during use and possibly remains airborne for several minutes.  Liquids: Boiling point < 50oC | LARGE  > 100g (ml) | 3 |
| NOTES: Multiply (A)x(B)x(C) to estimate overall risk level: ≤ 7 Low; 8-11 Medium; ≥ 12 High  \* For purposes of calculation, if a chemical has more than one risk phrase, use the one(s) with the highest health hazard score  \*\* When stating quantity, this should consider the quantity in the stock bottle as well as the quantity of the aliquots, since loss of containment from the entire stock bottle whilst removing aliquots may represent the greatest risk. | | | |

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| **5.1 Chemical hazard matrix** | | | | | | | |
| Substance | Route of exposure | Hazard Statement(s)\*  (see safety data sheet)  Please include all applicable) | ‡WEL | Health Hazard  Score | Dustiness / Volatility  Score | Quantity  Score | Overall  Risk Level  L/M/H |
| Inhalation (In) |
| Ingestion (Ig) |
| Skin contact (Sk) |
| Penetration (P) |
| Eye splash (Es) |
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| ‡Workplace Exposure Limit (if one has been assigned - see safety data sheet) – usually in ppm for vapours or mg/m3 for particulates. | | | | | | | |

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| 5.2 Factors influencing risk of exposure | | | | | | | |
| Are there any process factors that influence the route of exposure (see section 6.2 for control measures) | | | | | | | |
| Weighing | | | | Pipetting | | Filtering | Elevated Temperature |
| Shaking or Mixing | | | | Centrifugation | | Use of Sharps | High Pressure |
| Other | | | | | | | |
| 5.3 Identification of those at risk of exposure | | | | | | | |
| Are there any substances listed in this activity having the Hazard Statements H360, 361 or 362 (those affecting women of child-bearing age)? | | | | | | | |
| YES | NO | | If ‘Yes’:  any females working with the substance must be informed that the substance(s) present a reproductive toxicity hazard.  should they fall pregnant or are trying for pregnancy, then they have the option of contacting Occupational Health for a detailed confidential health assessment.  they should also avoid being involved in any large-scale spillage clean up in the event that such an incident arises. | | | | |
| Are there any substances listed in this activity having the Hazard Statement H317 (skin sensitisers)? | | | | | | | |
| YES | NO | | If ‘Yes’:  ensure these substances are never handled without gloves and all other skin areas are covered during handling. | | | | |
| Are there any substances listed in this activity having the Hazard Statements H334, H340, 341, 350 or 351 (respiratory sensitisers, substances causing genetic defects or cancer)? | | | | | | | |
| YES | NO | | If ‘Yes’, this risk assessment once completed, must be submitted to the Safety Department ([**safetydept@imperial.ac.uk**](mailto:safetydept@imperial.ac.uk)) for review before work is carried out. Information will be uploaded to a central database for record keeping purposes. | | | | |
| If ‘Yes’ is answered to either of the above questions, indicate the frequency and duration of use | | | | | | | |
|  | | | Frequency (how often is the substance used) e.g. every day; once a month etc. | | | | |
|  | | | Duration (how long is possible exposure likely to be) e.g. five minutes; one hour etc. | | | | |
| 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: | | | | |
| Are there any personnel other than laboratory workers who may be at risk from exposure? (e.g. maintenance workers, cleaners etc.) | | | | | | | |
| YES | NO | | If yes, give details: | | | | |
| 5.4 Substances subject to other legislation | | | | | | | |
| Are there any substances involved in this activity that are subject to either the [Chemical Weapons Act](https://www.legislation.gov.uk/ukpga/1996/6/contents) or the [Anti-terrorism, Crime and Security Act](https://www.legislation.gov.uk/ukpga/2001/24/contents)? You must keep a record of usage for Schedule 2 chemical weapons precursors as you will be contacted by the Safety Department on an annual basis | | | | | | | |
| YES | | NO | | | If yes, give details: | | |
| Are there any substances involved in this activity that are listed by the Home Office as [drugs precursors](https://www.gov.uk/precursor-chemical-licensing)? | | | | | | | |
| 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 oxidising? (See Q5.1) | | | | | | | |
| YES | | NO | | | If yes, give details: | | |
| 5.5 Other hazards | | | | | | | |
| Are there any other hazards involved with this activity? (e.g. pathogens, GMOs, ionising radiation etc.) If ‘Yes’ have these risks been assessed and any necessary approvals obtained? | | | | | | | |
| YES | | NO | | | If yes, give details and/or reference numbers of related documentation: | | |

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| 5.2 Factors influencing risk of exposure | | | | | | | |
| Are there any process factors that influence the route of exposure (see section 6.2 for control measures) | | | | | | | |
| Weighing | | | Pipetting | | | Filtering | Elevated Temperature |
| Shaking or Mixing | | | Centrifugation | | | Use of Sharps | High Pressure |
| Other | | | | | | | |
| 5.3 Identification of those at risk of exposure | | | | | | | |
| Are there any substances listed in this activity having the Hazard Statements H360, 361 or 362 (those affecting women of child-bearing age)? | | | | | | | |
| YES | NO | | | If ‘Yes’:  any females working with the substance must be informed that the substance(s) present a reproductive toxicity hazard.  should they fall pregnant or are trying for pregnancy, then they have the option of contacting Occupational Health for a detailed confidential health assessment.  they should also avoid being involved in any large-scale spillage clean up in the event that such an incident arises. | | | |
| Are there any substances listed in this activity having the Hazard Statement H317 (skin sensitisers)? | | | | | | | |
| YES | NO | | | If ‘Yes’:  ensure these substances are never handled without gloves and all other skin areas are covered during handling. | | | |
| Are there any substances listed in this activity having the Hazard Statements H334, H340, 341, 350 or 351 (respiratory sensitisers, substances causing genetic defects or cancer)? | | | | | | | |
| YES | NO | | | If ‘Yes’, this risk assessment once completed, must be submitted to the Safety Department ([**safetydept@imperial.ac.uk**](mailto:safetydept@imperial.ac.uk)) for review before work is carried out. Information will be uploaded to a central database for record keeping purposes. | | | |
| If ‘Yes’ is answered to either of the above questions, indicate the frequency and duration of use | | | | | | | |
|  | | | | Frequency (how often is the substance used) e.g. every day; once a month etc. | | | |
|  | | | | Duration (how long is possible exposure likely to be) e.g. five minutes; one hour etc. | | | |
| 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: | | | |
| Are there any personnel other than laboratory workers who may be at risk from exposure? (e.g. maintenance workers, cleaners etc.) | | | | | | | |
| YES | NO | | | If yes, give details: | | | |
| 5.4 Substances subject to other legislation | | | | | | | |
| Are there any substances involved in this activity that are subject to either the [Chemical Weapons Act](https://www.legislation.gov.uk/ukpga/1996/6/contents) or the [Anti-terrorism, Crime and Security Act](https://www.legislation.gov.uk/ukpga/2001/24/contents)? You must keep a record of usage for Schedule 2 chemical weapons precursors as you will be contacted by the Safety Department on an annual basis | | | | | | | |
| YES | | NO | | | If yes, give details: | | |
| Are there any substances involved in this activity that are listed by the Home Office as [drugs precursors](https://www.gov.uk/precursor-chemical-licensing)? | | | | | | | |
| 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 oxidising? (See Q5.1) | | | | | | | |
| YES | | NO | | | If yes, give details: | | |
| 5.5 Other hazards | | | | | | | |
| Are there any other hazards involved with this activity? (e.g. pathogens, GMOs, ionising radiation etc.) If ‘Yes’ have these risks been assessed and any necessary approvals obtained? | | | | | | | |
| YES | | NO | | | If yes, give details and/or reference numbers of related documentation: | | |

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| 6. PREVENTION OF EXPOSURE | | | | | | | | | | |
| 6.1 Elimination, substitution and process change | | | | | | | | | | |
| Can any of the substances used be eliminated from the protocol? | | | | | | | | | | |
| YES | NO | | | | If yes, give details: | | | | | |
| Can any of the substances used be substituted by a safer alternative or a safer form of the same substance? | | | | | | | | | | |
| YES | NO | | | | If yes, give details: | | | | | |
| Can the protocol be changed so that the method of work giving risk to exposure is no longer necessary? | | | | | | | | | | |
| YES | NO | | | | If yes, give details: | | | | | |
| Are measures in place to exclude non-essential personnel from the area? | | | | | | | | | | |
| YES | NO | | | | If yes, give details: | | | | | |
| 6.2 Control of exposure | | | | | | | | | | |
| 6.2.1 Minimising quantities | | | | | | | | | | |
| Can the quantities of the substances stored, used and produced as waste be reduced? | | | | | | | | | | |
| YES | | NO | | | | If yes, give details: | | | | |
| 6.2.2 Containment and ventilation | | | | | | | | | | |
| Can some or all parts of the process be carried out on the open bench with good general ventilation? (if additional containment such as drip trays are required, give details) | | | | | | | | | | |
| YES | | NO | | | | If yes, give details: | | | | |
| Is a fume cupboard or other form of local exhaust ventilation required for any part of the process? | | | | | | | | | | |
| YES | | NO | | | | If yes, give details (include type and location): | | | | |
| Is the fume cupboard or other form of local exhaust ventilation subject to a maintenance regime? | | | | | | | | | | |
| YES | | NO | | | | If yes, give details (date of last test and who is responsible for maintenance): | | | | |
| Do measures need to be taken to control sources of ignition? | | | | | | | | | | |
| YES | | NO | | | | If yes, give details: | | | | |
| Is a chemical spill kit required? | | | | | | | | | | |
| YES | | NO | | | | If yes, give details (including location and how often checked/maintained): | | | | |
| 6.2.3 Storage and transportation | | | | | | | | | | |
| If relevant, outline the storage arrangements: | | | | | | | | | | |
| Toxic | | | | | | | | |  | |
| Corrosive | | | | | | | | |  | |
| Flammable/Highly or extremely flammable | | | | | | | | |  | |
| Other | | | | | | | | |  | |
| Will any of these substances need to be transported to other parts of the same building or other buildings on the same campus? | | | | | | | | | | |
| YES | | | NO | | | | If yes, give details of how containment will be assured: | | | |
| Will any of these substances need to be transported to other campuses or off site? | | | | | | | | | | |
| YES | | | NO | | | | If yes, specify:  Site:  Substance and quantity:  Method of transport proposed:  Containment precautions: | | | |
| 6.2.4 Personal protective equipment (PPE) | | | | | | | | | | |
| Gloves YES  NO  if yes, please specify type | | | | | | | | | | Eye/face protection YES  NO  If yes, please specify type: |
| Lab coat YES  NO | | | | | | | | | | Respiratory protection YES  NO  If yes, please specify type and whether face fitting is required: |
| Other (please specify) | | | | | | | | | | |
| Is PPE needed for all parts of the protocol or in emergencies only?: | | | | | | | | | | |
| 6.2.5 Waste disposal | | | | | | | | | | |
| Outline the disposal route for each substance. Biological waste generated as part of this protocol should also be mentioned here: | | | | | | | | | | |
| Substance | | | | | | | | | Route of disposal/treatment | |
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| 6.2.6 Hygiene measures | | | | | | | | | | |
| Describe the hygiene measures in place for work involving these substances, e.g. handwash facilities, laundering of protective clothing, storage of personal clothing, prohibition of eating and drinking etc.: | | | | | | | | | | |
|  | | | | | | | | | | |
| 6.2.7 Monitoring and training | | | | | | | | | | |
| Is monitoring necessary to validate the efficacy of control measures for any of these substances? E.g., use of formaldehyde meter | | | | | | | | | | |
| YES | | | | NO | | | | If yes, give details: | | |
| Describe the information, instruction, training and supervision requirements for those working with these substances (include details of record keeping): | | | | | | | | | | |
| YES | | | | NO | | | | If yes, give details: | | |

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| 7. EMERGENCY PROCEDURES | | |
| Do not cut and paste information on emergency procedures and first aid from the MSDS – it must reflect procedures that are available within the local area (laboratory, building or campus concerned) and be proportional to the extent of exposure anticipated. | | |
| 7.1 Spillage or release | | |
| If the spillage involves an unidentified chemical, evacuate the area and contact safety personnel.  Describe the procedures in place for a spillage or release for any biological or chemical substance in this protocol which is hazardous. For non hazardous substances, please specify general clean up and disposal procedures:  Within the laboratory but outside any primary containment facility such as a fume cupboard:    Within a fume cupboard (if relevant):    Outside the laboratory e.g. en route to another part of the building / site: | | |
| 7.2 First Aid | | |
| For chemically contaminated needle stick injuries, encourage wound to bleed and wash with plenty of water. If there are any prolonged effects (e.g. inflammation, discolouration, pain) call Security to arrange for immediate transport to hospital and ensure you take the relevant SDS with you.  Describe the local first aid arrangements that are in place for accidental exposure to any of these substances: | | |
| If eyewash facilities are required, is there a mains fed eyewash or shower available? | | |
| YES | NO | If required but not present, give details of alternative facilities: |
| Is there a maintenance/flushing schedule in place for any mains fed eyewash or shower facilities? | | |
| YES | NO | If yes, give details: |

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| REVIEW MATRIX | | | | |
|  | The person undertaking or reviewing must write their name and date below | | | |
|  | Initial Review | Review 1 | Review 2 | Review 3 |
| Due date |  |  |  |  |
| Date conducted |  |  |  |  |
| Conducted by |  |  |  |  |