



MOLEC (Molecular electronics) Laboratory

James Watt Building South, Rm 241

Lab Responsible Academic: Dr Roy Vellaisamy

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Lab Manager: Mr Lau Siu Chuen

(siuchuen.lau@glasgow.ac.uk)

CODE OF PRACTICE

The adoption and practice of good safety procedures is of paramount importance for both the health and safety of fellow workers, and for the integrity of the fabric of the MOLEC (Molecular electronics) Laboratory.

1. Lab Safety Management Responsibilities

- 1) **Everyone** has a role in protecting the health and safety of both other lab users and themselves, and thus should be familiar with the **School's Safety Manual**.
- 2) **Academic Supervisors** take full responsibility for the health and safety of their own group's research activities, and consequently must ensure their staff and students are familiar with both the content of this **Code of Practice** and the **School's Safety Manual** and apply its requirements.
- 3) The **Lab Responsible Academic** is the academic member of staff responsible for overall lab activities.
- 4) No research activities shall be carried out in the MOLEC Lab without the prior permission of the **Lab Responsible Academic (or as delegated to the Lab Manager)**. The role of the Lab Responsible Academic is specified in **Appendix A**, in accordance with the **School's Safety Manual**.
- 5) No work shall be carried out until a **Risk Assessment** has been conducted by the research staff/students, **approved by their Supervisor** and the **Director of Safety**, and acknowledged by the **Lab Responsible Academic**.
- 6) An **electronic copy** of the approved Risk Assessment shall be sent to the Lab Responsible Academic to be kept as record (note that this can be done using the online risk assessment system). A hard copy of the approved risk assessment shall be displayed next to the relevant research rig and equipment for inspection. The procedures of the preparation of Risk Assessment are summarised in **Appendix B**.
- 7) The hazard statements of chemicals commonly used in the MOLEC lab are given in **Appendix C**, however specific Risk Assessments should be undertaken detailing the methods employed when using these materials and others in, for example, synthetic procedures or other potentially hazardous activities.
- 8) **All lab users** should make themselves aware of the **general safety procedures** highlighted in the School's Safety Manual and of the location of safety equipment in the lab. The Safety Manual is available on the School's website.

These are:

In case of emergency, dial telephone number: **4444 (internal), 0141 330 4444 (external)**

Be aware of the location of emergency exits & assembly point (A. Front of James Watt South, B. North Front Flag Pole)

Be aware of the location of fire extinguishers & the type of fire they tackle (located inside the lab, by the door; one carbon dioxide extinguisher)

Be aware of the location of the First Aid kit (located inside the lab, next to the stainless steel sink – hand washing facilities)

Be aware of the location of the eye wash station (located inside the lab, next to the fume cupboard)

Be aware of the location of the spill kit (located inside the lab, next to the fume cupboard)

Hand washing Facilities: Located inside lab.

- 9) Work outside normal office hours (including weekend working) requires the permission of your supervisor. This can be given by an e-mail trail for audit purposes in the event of an accident and can be for multiple or extended periods of time. If permitted, the out-of-hours working book located in the foyer of the James Watt South building must be signed and the time recorded on arrival and the time of departure. Potentially dangerous operations **must never** be undertaken out-with normal hours **unless a second responsible person is present**. (Please read the safety regulations in the School's Safety Manual for more details.) Note: Permission for work outside normal office hours (8 am to 5 pm) will not be granted while Covid 19 restrictions are still in place (this will be reviewed periodically).
- 10) No research equipment should be used, unless the user has attended a lab induction, has received prior training for that particular piece of equipment and the use has been approved by the Lab Responsible Academic (or as delegated to the Lab Manager)
- 11) A **Lab Manager** is appointed to oversee day-to-day activities in the MOLEC Lab on behalf of the Lab Responsible Academic and Lab Management Team. The lab manager will work closely with the Lab Responsible Academic and the Academic Supervisors who use the lab. Safety monitoring is therefore carried out by the Lab Manager, the Lab Responsible Academic and the Academic Supervisors. The Lab Manager, Lab Responsible Academic and Academic Supervisors shall communicate regularly to ensure that lab users adhere to the Code of Practice and to the Guidance Notes and Risk Assessments for particular items of equipment.
- 12) The **Lab Management Team** consists of the Lab Responsible Academic, the Lab Manager and the Academic lab users who are also members of the Materials and Manufacturing Research Group. It is the responsibility of the Lab Management Team to approve any major changes to the lab, its operation or its Code of Practice.

2. Practice of General Activities

- 1) The experimental area must be **kept tidy and clean**. This is **NOT** the responsibility of the cleaners. Good housekeeping must be maintained by the lab users and be monitored by the lab management team. After each lab session, users should return



the lab to its original state of cleanliness (except for experimental rigs that need to remain on benches)

2) Food and drinks are not permitted in the lab.

- 3) There is one exit from the lab (Main Door), follow the fire exit indication, go through the corridor, go to safety exit between level 3 and level 4 by stair of James Watt Building South – this route **MUST** be kept clear. If anything is impeding the exit, then you should either move them, contact the person who placed them there, or inform the Lab Manager or Lab Responsible Academic.
- 4) Do not place equipment anywhere that will block access to other locations.
- 5) Dedicated storage cupboards and areas must be used. Bench tops should not be used as storage areas.
- 6) When leaving the lab (and if there are no other users in the lab), ensure that the lab main door is fully shut & secured and the James Watt South building outside main door is also fully shut & secured.
- 7) Equipment must be placed in appropriate locations to safe-guard its integrity, minimise potential damage and to allow other researchers access to it. Never place equipment on a floor where others may walk around, always place it on a platform. Please follow the advice of the Lab Manager or Lab Responsible Academic regarding storage.
- 8) Once experimental work has been completed and the experimental setup is no longer required, the **experimental area must be cleared** in preparation for other experiments and researchers.
- 9) If it is necessary to remove equipment from the lab, permission must be given by your supervisor and the Lab Responsible Academic. If approved, the 'Tools & Equipment on Loan' form should be filled out upon removal of the equipment and its return. If necessary, seek assistance with moving heavy items.
- 10) If equipment breaks down or is not working, report the fault to your supervisor and the responsible person (see Section 5) immediately.
- 11) A fault with the fabric of the room or anything that will compromise safety, such as a lighting failure, should be reported through the Maintenance Request portal found on the Estates and Commercial Services webpage, <http://www.gla.ac.uk/services/estates/>. You should also inform both the Lab Manager and the Lab Responsible Academic.
- 12) There are many smaller handheld tools and items of equipment in the lab. All items have a designated storage location either in dedicated researcher storage or in general storage. Following use, please ensure that all items are returned to the correct location. Contact the Lab Manager if unsure about the correct storage location for a particular item.

3. General Lab Conditions

- 1) **Electrical connections** between different devices or equipment should be safe. If in doubt, speak with technicians in the Electrical Workshop (JWS Room 619) and inform the Lab Manager or Lab Responsible Academic.

- 2) To minimise **trip hazards**, extension cables should be plugged into the closest socket and avoid crossing pathways. If crossing a pathway is totally unavoidable then, only as a temporary measure, the cable must be secured to the floor and covered with a suitable (commercially supplied) floor cable cover/protector to prevent tripping hazards.
 - i. Once equipment is not in use, it must be turned off and any extension cables used should be tidied to a suitable location.
 - ii. Leads and plugs should ONLY be used on the allocated item of equipment and should NOT be switched between equipment
 - iii. All equipment plugged into university outlets must be PAT tested (contact the electrical workshop for testing).
- 3) To minimise the risk of **falling objects**, no equipment or lab materials should be kept on top of cupboards and file cabinets.
- 4) Fire hazards:
 - i. All **flammable materials** (gases, liquid and solids) should be stored and handled in accordance to the School's Safety Manual and relevant SEPS guidelines.
 - ii. All equipment or experimental rigs using flammable materials should be certified and have adequate measures for preventing fire hazards.
 - iii. All users of flammable gases should be trained.
- 5) Explosion hazards when using compressed gases:
 - i. All gas cylinders should be secured to prevent falling.
 - ii. All pressure vessels should be certified by a professional manufacturer.
 - iii. All pressure vessels should have measures to prevent over-charging, such as relief valves.
 - iv. You should seek support from technicians when moving gas cylinders.
 - v. All users of compressed gases should be trained.
- 6) If you are unsure how to correctly use an item of equipment, seek assistance from an appropriate responsible person(s) (see Section 5).

4. Biological/tissue work/Chemicals

1. If you are doing experiments in microbiology related areas, then you will need to have appropriate training before starting this work.
2. All waste products must be placed in Biological Waste containers contact Laboratory Services to arrange for disposal.
3. Chemicals (e.g. acetone) should be stored and disposed of according to the School of Engineering Safety Manual. Contact the School Safety officer if unsure.



5. Requirements & Responsible Persons for Specific Lab Equipment

This section gives details on equipment specific requirements and lists the responsible personal to contact - Lab manager: Mr Lau Siu Chuen (siuchuen.lau@glasgow.ac.uk)

No Lab User can use the laboratory or its equipment until a full lab induction has been completed and the relevant training on apparatus provided by the Lab Guardian or their appointee.

5.2 Grinding and Polishing

MOTOPOL 2000 and METASERV 2000 (Grinding/Polishing)

- Be sure that the machine is turned off while making any adjustments. Never place hands or arms close to the machine while it is turned on.
- Students are asked to read the machine manuals carefully before use and undertake appropriate training before operating for the first time.

5.3 Furnaces –

The furnace will be installed.

All users of this equipment must be trained and deemed competent by the Lab Guardian (or their appointee) before being permitted access.

- When using the furnaces, ensure that the relevant personal protective equipment (PPE) is worn. This is detailed in the Risk Assessment documents associated with the furnaces. The PPE is provided in the lab. Eye protection, face protection, foot protection and heat resistant gloves are required.
- Never handle hot materials – furnace tongs should be used. Hold them away from yourself and others.
- When the chamber furnace is in use, use the portable air extractor positioned near the furnaces to extract particles/fumes when the furnace door is opened.
- When using the furnaces, ensure that the microscopes are fully covered.
- Students are asked to read the furnace manuals carefully before use and undertake appropriate training before operating for the first time.

This needs a Risk Assessment in addition

5.4 Microscopy

OLYMPUS BH-2 Microscope

- The microscopes require a high level of cleanliness. Only relatively clean specimens should be used.
- Take care never to touch or scrape the lenses/objectives.
- Never try to remove lenses – Contact the responsible academic
- Never try to remove structural screws etc. (this can case the lens to crash down) – contact the responsible academic.

- When finished using the microscopes, ALWAYS carefully replace the dust cover taking care not to accidentally adjust any finely set parts of the microscope.
- Students are asked to read the microscope manuals carefully before use and undertake appropriate training before operating for the first time.

Glove box

All users must have received practical training and deemed competent to operate this apparatus by the Lab Guardian (or their appointee) before being permitted access

- To avoid cracking of glass in the transfer chamber, always make sure that your container is vacuum compatible.
- When entering or exiting flammable, pyrophoric or toxic chemicals, always take the chemical into the box if you suspect that it has ruptured or leaked in the transfer chamber.
- When you remove flammable or pyrophoric chemicals from the transfer chamber, wear a face shield and leather gloves. If it is highly pyrophoric (metal organic compounds), wear a fire resistant suit.
- When handling toxic chemicals, follow the safety guidelines in the data sheets that came with the chemical.
- If the gloves get punctured, seal the glove following the procedures in the BOP for the glove box. Contact the person responsible for the glove box.
- Make sure that the chemicals you are using are compatible with butyl gloves. This should be stated in the data sheets that came with the chemical.
- Highly pyrophoric, highly toxic chemicals are not allowed.

This needs a Risk Assessment in addition

Fume cupboard

Recirculating fume cupboards must not be used for highly toxic chemicals, or for regular use of toxic and/or flammable solvents in large quantities. They are not suitable for:

- Radioactive substances
- Any substance for which the filters are not specified
- Boiling off large quantities of solvents or acids

Preparing to use the fume cupboard

- Position equipment, apparatus, and materials in the centre and back of the cupboard to minimise disturbance to the airflow. Do not obstruct the rear baffle.
- Equipment in the fume cupboard should be kept to a minimum and sited at least 150mm inside the plane of the sash to ensure efficient containment. Keep items away from the sash opening to allow instant closure in an emergency.
- Avoid placing large pieces of equipment in a fume cupboard - they spoil the aerodynamic flow and may reduce the containment of fumes. If their use cannot be avoided they should be raised up about 10cm using lab jacks, in order to allow air to pass unimpeded across the work surface and to be exhausted from rear of fume cupboard.
- The experimental materials must be sited at least 150 mm inside the plane of the sash to ensure efficient containment.

During use



- Fume cupboards should be used with the sash as low as reasonably practicable as this gives the best containment of fume/vapour and helps contain any fire or explosion that may occur. The maximum height when working at the fume cupboard should be 0.5m, and where reasonably practicable should be lower.
- Use the sash position to your advantage -
 - Fully open, to provide access for setting up equipment
 - Partially open, to a comfortable work height when handling the material inside the cupboard
 - Lowered as far as is practicable, when the process is in operation and your intervention is no longer required, including when stepping away for any period of time.
- Try to avoid sudden rapid movements in front of the cupboard. These can cause turbulence that may draw the airborne hazardous material out of the cupboard.
- Do not use naked flames as they will have a serious adverse effect on the air flow.
- Perchloric acid must not be used in fume cupboard
- Chemicals must not be stored in a fume cupboard used for experimental work - they could escalate an accident.
- Hotplates must be kept to a minimum and be aware that they might adversely affect the airflow. If hot plates are used, these should be placed at least 10 cm from the side and back of the cupboard to avoid damage to the cupboard structure.
- Any accidental spill of chemicals must be cleaned up immediately (i.e. as soon as it is safe to do so).
- If an experiment is left running out of hours, a contact name and telephone number must be prominently displayed. Do not leave potentially hazardous work unattended.

After use

- At the end of your experiment remove equipment and clean the surfaces. Leave the fume cupboard in a clean, tidy and safe state.
- Dispose of waste in a safe appropriate manner as identified by the risk assessment and in accordance with laboratory rules.

Emergencies

- If the ventilation system fails, immediately stop working. If safe to do so, replace lids on containers and terminate any ongoing processes.
- Pull the sash as low as possible and move away from the fume cupboard. Warn other workers there is a problem.
- Deal with spillages immediately, using the correct absorption materials. Dispose of as hazardous waste.
- Treat fires with extreme caution. The use of high pressure CO₂ may spread flames and eject items out of the fume cupboard. Only tackle fires if you have the correct fire fighting equipment and have been trained to use it. Otherwise, close the sash and if possible turn off the fume cupboard. Raise the alarm by activating the fire alarm (press red manual call point) and phone the emergency services (999). Evacuate the building.

5.7 Other Equipment

- In relation to other items of commercial equipment, students should seek advice before use
- In relation to student/researcher designed experimental equipment, it is the student/researchers responsibility to ensure that the equipment is safe for both themselves and other lab users (i.e. no sharp edges, no dangerous electrical installations – please ask the Electrical Workshop in the Rankine or James Watt Buildings to check these aspects).

6. Covid-19 Measures

The following additional measures are in place as of 18th June 2020 to ensure that the lab is a safe working environment during the Covid 19 Pandemic. The Lab Management Team will review these measures periodically in line with University and Government requirements.

- 1) Up-to-date guidance from the HSE, UK Government and Scottish Government to manage the risk related to Covid-19 pandemic must be applied in the MOLEC Lab. These include physical distancing, frequent hand washing and hygiene measures, cough etiquettes and face covering in enclosed public space. Considerations for codes of practice and risk assessment for the James Watt School of Engineering can be found here (<https://www.gla.ac.uk/schools/engineering/informationforstaff/safety/>)
- 2) Physical distancing within the MOLEC Lab means a **maximum capacity of 2 people** working at any given time. The two **users must remain 2 meters apart at all times** (even when walking around the lab). More than 2 people are not permitted to occupy the lab simultaneously. The lab will be divided into clearly marked sections (via floor markings) and only one researcher should occupy these at any one time.
- 3) It is mandatory to wear **face coverings** in the lab during COVID lockdown period.
- 4) Morning and afternoon sessions will be available to book through the Bookkit system or the tools used from time to time. (from Monday to Friday during the hours 8 am to 5 pm)
- 5) Users from the morning session should leave on time and ensure that they do not meet the incoming users (unless one morning user is remaining for the afternoon session). A time gap is deliberately included between sessions to ensure that morning and afternoon users do not overlap.
- 6) Lab users must **wash their hands** regularly and **wipe workstation surfaces, materials, and equipment** at the start of their work and before leaving (this refers to items they will touch or have touched). Users should consider which parts of equipment they have touched and wipe these clean before leaving the lab. Users should allow time at the end of their lab session (e.g. 10 mins) to undertake the required cleaning.
- 7) Hands should be washed (within the lab): after blowing your nose, sneezing or coughing, and before and after sessions that involve touching lab equipment.
- 8) Emergency support (First Aiders and Fire Area Officer) might be constrained due to Covid-19 restriction on building capacity. Task risk assessments need to be reviewed to include the above measures and to review with personnel through the risk



assessment, which work can be safely undertaken with reduced access to emergency support. A Covid-19 risk assessment template can be found here (https://www.gla.ac.uk/media/Media_723618_smx.docx).

- 9) Toilet facilities are provided on level 3 of James watt South Building
- 10) The Covid 19 Lab Guardian for the Molecular Electronics lab is the Lab Responsible Academic.
- 11) Induction: All users of the lab after 18th June 2020 must have attended a remote induction and training session on the Covid 19 procedures specific to the Molecular Electronics Lab
- 12) No lab work is permitted outside normal working hours (i.e. Monday to Friday, 8 am to 5 pm). This provision will be reviewed regularly, so contact the lab management for up-to-date information.

Appendix A: Duties of the Lab Responsible Academic, Lab Manager and Lab Management Team

A1. Lab Responsible Academic

According to the School's Safety Manual, the **Lab Responsible Academic is responsible for implementing safety policies in the Lab on a day-day basis**. The Lab Responsible Academic (acting on behalf of the Lab Management Team) is also responsible for the overall running of the lab. For the MOLEC Lab, the specific duties of its Lab Responsible Academic are: :

- 1) to maintain the Code of Practice (CoP);
- 2) to ensure the lab users keep their area in tidy and clean condition;
- 3) to ensure each activity (experimental rig/equipment) has a Risk Assessment before work commences;
- 4) to coordinate actions according to the School Director of Safety's report / instructions following inspections;
- 5) to liaise with the Lab Manager, and the Academic supervisors in order to ensure the safety and upkeep of both the lab and its equipment.

The appointment of the Lab Responsible Academic

- 1) The Head of SPE Research Division, in consultation with the Lab Management Team, appoints the Lab Responsible Academic for the MOLEC Lab (currently Mr. Lau).
- 2) The Lab Responsible Academic of the MOLEC Lab reports to the Head of Research Division (in this case The HoRD, Electronic and Nano scale Engineering).

A2. Lab Manager

The Lab Manager (if appointed) is a researcher who assists the Lab Responsible Academic (and Lab Management Team) in overseeing the day-to-day running of the lab. The Lab Manager also assists the Lab Responsible Academic in ensuring that the Code of Practice and other more detailed safety procedures and Risk Assessment requirements are followed. The Lab Responsible Academic and Lab Management Team may delegate certain duties to the Lab Manager.

The appointment of the Lab Manager

- 1) The Lab manager is appointed by the Lab Management Team.

A3. Lab Management Team

The Lab Management Team comprises the academic staff users of the lab who are also members of the Communication, Sensing and Imaging Group. Duties are:

- 1) To approve any major changes to the configuration, structure or operation of the lab or its Code of Practice. (this includes the addition or removal of equipment that will require permanent lab or bench space)
- 2) To appoint the Lab Manager and to assist the Head of Division in appointing the Lab Responsible Academic



Appendix B: Procedures of the preparation of the Risk Assessment

1. PDRAs and PG/UG students are responsible for formulating Risk Assessments on a day-to-day basis. For potentially hazardous activities, in addition to assessing the risks, the risk assessment form should include a standard operating procedure/method statement (and/or instrument manual) as an appended document.
2. Whilst the preference is for the persons undertaking the practical work to make their own risk assessments, it is permissible to use the on-line multi-user risk assessment forms for activities that will be undertaken by groups of people. However, in this case, each person involved in the practical work must sign the multi-user form online and a strict regime of user training should be in place that encompasses both the risks associated with the work as well as the practicalities of undertaking it.
3. Academic supervisors should assist the PDRAs and PG/UG students in preparing the risk assessment (this would typically be the case for less experienced PDRAs and PG/UG students). They should **ensure** foreseeable risks have been identified and adequate mitigation measures have been provided to reduce them as far as possible.
4. The academic supervisors should then approve the risk assessment form online (or ask for further information to be added); the Lab Responsible Academic should also acknowledge (on-line or otherwise) that the risk assessment has been completed, to indicate that as far as they can see, this activity does not conflict (in safety terms) with other activities in the lab. The Lab Responsible Academic can also ask for further clarifications/additions concerning the procedures involved to be made, if necessary.
5. After the risk assessment has been approved/acknowledged by the supervisor and Lab Responsible Academic/Lab Guardian, the School's Director of Safety approves, seeks further clarifications, or (exceptionally) rejects the risk assessment if there are clearly hazards that cannot be sufficiently mitigated.
6. An e-copy of the **approved** Risk Assessment should be sent to the Lab Responsible Academic by the PDRA or PG/UG student that originated the assessment (n.b. pdf's of the online form can be made by using the Print to PDF option available in most browsers)
7. A hard copy of the approved Risk Assessment and standard operating procedure should be kept or displayed next to the relevant experimental rig or equipment.
8. The Lab Responsible Academic approves the start of activity after receiving the **approved** Risk Assessment.
9. If there is any substantial change to the people or research activity as stated in the Risk Assessment, it **MUST** be revised accordingly, and pass procedures 1-7 as above.

Appendix C: Hazard classification of chemicals commonly used in MOLEC lab

CoSHH Assessment										
Assessment Title: Risks associated with Commonly used chemicals in the MOLEC lab										
Assessment Reference Number:										
School / Service / Location: JAMES WATT SCHOOL OF ENGINEERING JWS R241										
Safety Coordinator:										
Details of Hazardous Substances (Please attach safety datasheets where available)										
Name of Substance (Include all substances used or produced)	Quantity kg / g / ml	Physical Form	GHS Hazard Classification (Tick all that apply)							
			 Explosive	 Flammable	 Oxidiser	 Comp. Gas	 Harmful	 Corrosive	 Toxic	 Health Hazard
Sulfuric acid	5L	liquid						✓		
Graphene oxide	25g	powder								
Spermine	250g	powder						✓		
4-Phenolsulfonic acid	500g	powder					✓	✓		
Phenol	1Kg	powder						✓	✓	✓
Ferrocenemethanol	25g	powder					✓			
Potassium nitrate	2.5Kg	powder			✓		✓			
Potassium Dihydrogen Orthophosphate	1kg	powder								
Ammonium Chloride	1Kg	powder					✓			
Creatinine	1Kg	powder								
Sodium Sulphite (hydrated)	1kg	powder					✓		✓	
Acetone	10L	liquid		✓			✓			
Ethanol	20L	liquid		✓			✓			
Urea	1kg	powder								
Sodium Chloride	2.5kg	powder								
Hydrogen Orthophosphate (anhydrous)	1kg	powder								
Special Hazards (*Separate risk assessment may be required)										
 Carcinogenic Substance	Details:		 Skin Sensitiser	Details:		 Respiratory Sensitiser	Details:			
 Biological Material*	Details:		 Radioactive Substances*	Details:		 Explosive Atmosphere*	Details:			
Further Details / Other Special Hazards:										



Exposure to Hazardous Substances						Workplace Exposure Limits	
Substance	Possible Exposure Route (Please tick)					8h TWA	15min STEL
	Inhalation	Ingestion	Skin	Injection	Other (State)		
Sulfuric acid	✓	✓	✓				
Graphene oxide			✓				
Spermine			✓				
4-Phenolsulfonic acid			✓				
Phenol	✓	✓	✓				
Ferrocenemethanol			✓				
Potassium nitrate			✓				
Potassium Dihydrogen Orthophosphate			✓				
Ammonium Chloride			✓				
Creatinine			✓				
Sodium Sulphite (hydrated)			✓				
Acetone		✓	✓				
Ethanol		✓	✓				
Urea			✓				
Sodium Chloride			✓				
Hydrogen Orthophosphate (anhydrous)			✓				
Description of Activity (Continue on a separate sheet if required)							
<ul style="list-style-type: none"> • Material cleaning. • Surface modification of various metallic and polymer substrates. • Chemical Vapor Deposition of topological insulators, metal oxides and carbon-based materials. • Characterization and validation of the proposed product. 							
Persons at risk:							
Summary of Control Measures							
Assessment of the risks from exposure to substances involved in this procedure (include any existing control measures already in place)	Inhalation, Ingestion and contact skin due to Chemicals spill/leak are possible exposure route that cause risk to researcher. Adequate PPE, operate procedure and equipment such as Nitrogen glove box, fume cupboard are in place provided that the risk can be reduced to minimum.						
Risk Rating (Before Control)	High		Medium			Low	
Procedural Controls (e.g. lone working, hygiene)	NA						
Engineering Controls (e.g. fume cupboard)	Experiment that using oxygen sensitive, flammable and/or toxic chemicals will be carried out inside Nitrogen glove box						

	Experiment that using strong acid, base, solvent, will be highly exothermic, endothermic, and requiring heating will be carried out inside fume cupboard Closed shoes must be worn ie no open sandals			
PPE Requirements (Please give details) **Face fit testing required	 Dust Mask**		 Gloves	yes
	 Respirator**		 Footwear	
	 Eye Protection	yes	 Protective Clothing	yes
	 Face Shield		 Other (Specify)	
Instruction and Training	Students/staff will be trained before the experiments			
Supervision Required?	No			
Other safety precautions: (Including specialist first aid requirements)	No			
New Risk Rating	High	Medium	Low	
Supporting Information Checklist (Include details for each where relevant)				
Waste Disposal	All chemical waste will be treated under the Control of Substances Hazardous to Health Regulations (COSHH). Hazardous to Health Regulations (COSHH). There are three containers labelled for various chemical waste: Solvent waste Chlorine base waste Acid and others waste The waste disposal will go through School of Chemistry Store			
Emergency Procedures (including spill / leak control)	Spill/leak control kit will be available in the laboratory			
Atmospheric Monitoring	A proper meter will be installed in the laboratory.			
Health Surveillance	NA			
Supporting Risk Assessments (Please attach where relevant)	Biological	DSEAR	Radiation	
Assessment Details				
Assessed By: Mr. Siu Chuen LAU		Date: 30 Mar 2021		
Approved By: Professor Roy Vellaisamy		Date: 30 Mar 2021		
Date of next review:				
Description of Activity (Continuation sheet)				



Continuation sheet number:

CoSHH Assessment Acknowledgement

By signing this document I acknowledge that I have read and understood the attached CoSHH assessment and have familiarised myself with the safety control measures and protective equipment necessary to carry out the task safely. I hereby agree to follow the safe system of work required and implement the required safety procedures fully.

Full Name	Signature	Date Completed

