COSHH Risk Assessment

Newcastle University OHSS: H&S Form 401.1a

This form should be completed electronically and signed by the Principal Investigator or responsible person. Guidance on completing this form is provided in the COSHH Risk Assessment section of the OHSS website.

Section 1: Project Details

1.1.	**Title of project or activity**	Protein Purification		
1.2.	**Principal investigator/responsible person**	Dr. Arnaud Basle /Dr. Johan Panek		
1.3.	**School/Institute/Service**	Newcastle University – Biosciences Institute		
1.4.	**Location of work** building and room numbers	Cookson Building M3.032, M3.036		
1.5.	**Brief description of work activity**	Purification of over-expressed and natively expressed proteins by FPLC and gel chromatography from bacteria.		
1.6.	**Date of assessment**	05/03/2025	**1.7. Revision date***	

Section 2: Emergency Quick Reference

The purpose of this section is to provide easy access to emergency information. A full assessment of risk will be provided in the next sections and **completing this section last is advisable.**

2.1. Emergency contacts One of these should be the PI/responsible person Security can be contacted on extension 6666	**Name:**	Dr Arnaud Basle	Dr Johan Panek
	Position:	Facility Manager	Scientific officer
	Telephone number:	07528960883	07534980476

2.2. Hazard pictograms – select all that apply to the work activity.

 *Health hazard*	 *Toxic*	 *Corrosive*	 *Harmful/ Irritant*	 *Flammable*	 *Oxidising*	 *Explosive*	 *Compressed gas*	 *Danger for the environment*
X		X						

2.3. Name of hazard	**2.4. Properties of hazard** Briefly describe how the chemical is hazardous e.g. toxic, flammable, carcinogen	**2.5. Emergency procedures** Include, as appropriate, procedures for: • Contained Spill • Small uncontained spill, • Large uncontained spill • First aid • Fire
Ethanol 	Flammable	**Small uncontained spill:** Wear appropriate PPE. Remove sources of ignition and contain spill. Soak up with inert absorbent material and dispose of via closed waste route. **Large uncontained spill:** Wear appropriate PPE. Remove sources of ignition, contain spill and adequately ventilate area. Soak up with inert absorbent material and dispose of via closed waste route. **Fire:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool containers. Carbon monoxide and carbon dioxide pose as hazardous combustion products. Beware flashback.

2.3. Name of hazard	2.4. Properties of hazard Briefly describe how the chemical is hazardous e.g. toxic, flammable, carcinogen	2.5. Emergency procedures Include, as appropriate, procedures for: • Contained Spill • Small uncontained spill, • Large uncontained spill • First aid • Fire
Sodium Hydroxide 	Corrosive	**Small uncontained spill:** Evacuate area, wear appropriate PPE. Prevent water contamination. Collect up spill with brushing, avoid creating dust. Use absorbent material to clean up solution spill and dispose of through hazardous waste route. **First Aid:** Inhalation – move to fresh air and contact physician. Skin contact – Wash off immediately with soap and plenty of water, removing contaminated clothes and shoes, seek medical attention. Eye contact – Seek immediate medical attention and rinse water, including under eye lids for at least 15 minutes. Ingestion – Seek immediate medical attention and drink plenty of water.
Ethylenediaminetetraacetic acid (EDTA) 	Irritant	**Small uncontained spill:** Wear appropriate PPE. Contain spill and collect material using wet brushing and place in labelled container and dispose via hazardous waste. **First Aid**: Skin contamination- remove clothing and wash exposed area with soap and water. Seek medical advice. If inhaled move person to well ventilated area (fresh air) and seek medical attention. In cases of contact with eyes rinse immediately with plenty of water for 15 min and seek medical attention. If swallowed do not induce vomiting seek medical attention **Fire**: Special hazards arising from the substance or mixture-Carbon oxides, Nitrogen oxides. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide
MES 	Irritant	**First Aid:** Inhalation – remove to fresh air. Skin contact – rinse with plenty of water. Eye contact – rinse with water. Ingestion - seek medical attention, drink water.
Imidazole 	Corrosive, Flammable, Health Hazard	**First Aid:** Inhalation – remove to fresh air. Skin contact – Remove contaminated clothing and wash with soap and water. Eye Contact – Rinse with plenty of water for at least 15 minutes. **Fire:** Use water spray. Special hazards include products of carbon oxides, nitrogen oxides and hydrogen cyanide. **Small uncontained spill:** Wear appropriate PPE. Void dust formation. Ensure adequate ventilation.

Additional rows can be added to this table as required

Section 3: The Risk Assessment

Additional rows can be added to this table as required

3.1. Name of hazard including substances and by-products produced during or as a result of the activity.	**3.2. Properties of hazard** Provide details of how the substance could cause harm. Useful sources of information are the safety data sheet for the substance, Hazard (H) statements (give the whole phrase not just the code), and the workplace exposure limit.	**3.3. Physical form** e.g. powder, dust, granular, pellet, liquid, solution, gas.	**3.4. Quantity and concentration** (give units)	**3.5. Frequency of use** e.g. daily, weekly, monthly, one-off.	**3.6. Route of exposure** e.g. ingestion, inhalation, skin/eye contact, skin absorption, injection/sharps injury.
Ethanol 	H225 – Highly flammable liquid vapour H319 – Causes serious eye irritation	Solution Solution	99.8% 2.5L 20% 1L	Monthly Monthly	Contact skin/eye, ingestion
Sodium Hydroxide 	H312 – Acute toxicity (Dermal) H314 – Skin corrosion/irritation H318 – Serious eye damage/eye irritation H412 – Chronic aquatic toxicity	Powder Solution Solution	1 KG 1 M 1L 10 M 100 ml	Monthly Monthly Monthly	Contact skin/eye, Ingestion
Ethylenediaminetetraacetic acid (EDTA) 	H319-Causes serious eye irritation.	Powder Solution Solution Solution	>99% 500g 0.25M 500ml 50mM 1L 1mM 10L	Monthly Monthly Monthly Monthly	Ingestion, Inhalation, Contact skin/eye
MES 	H315 – Causes skin irritation H319 – Causes serious eye irritation H335 – May cause respiratory irritation	Powder Solution Solution	500G 50 mM 1L 1 M 100 ml	Monthly Monthly Weekly	Contact skin/eye, Inhalation
Imidazole 	H302 – Harmful if swallowed H314 – Causes severe skin burns and eye damage H360D – May damage unborn child	Powder Solution	1 KG 500 mM 1L	Weekly Monthly	Contact skin/eye, ingestion
3.7 Carcinogens All carcinogens and users of carcinogens should be notified to OHSS using the following link http://www.ncl.ac.uk/ohss/chemical/carcinogens.htm					

3.8. Dangerous Substances and Explosive Atmospheres (DSEAR)	**Yes**	**No**
Are you carrying out an activity/chemical reaction that is at risk of thermal runaway or explosion?		✓
Will the activity involve handling or storage of pyrophoric or unstable substances such as peroxide?		✓
Will flammable vapours, solid particles, fibrous particles etc. capable of forming an explosive atmosphere be present in the working atmosphere?	✓	

If the answer to any of the above questions is yes, you will need to complete a short 'add-on' DSEAR risk assessment

3.9. Who might be at risk? (tick all that apply)	**Staff**	**Postgraduates**	**Undergraduates**	**New or expectant mothers** (Contact Occupational Health)	**Contractors**	**Public including visitors and children**
	✓	✓	✓	✓		

3.10. Assessment of inherent risk to human health prior to the use of controls (please use the risk assessment matrix at the end of this form)	**High**	**Medium**	**Medium/low**	**Low**
			✓	

Section 4: Controls

Specify for <u>each hazard</u> identified in section 3. Precautionary (P) statements are a useful source of information.	
4.1. Physical or Engineering Controls. LEV, fume hood, glove box, total containment etc. **Specify at which point in the work activity they are to be used.**	N/A
4.2. Administrative controls Training requirements, access control, signage.	All staff and postgraduates carrying out this work activity will attend the chemical safety training course. In addition, postgraduates will receive on the job training in the procedure. They will be supervised until deemed proficient in the procedure by competent research staff. Stock solution swill only be made when needed and at a volume that should last some time –this reduces frequency of exposure to concentrated/neat substances.
4.3 Personal Protective Equipment. Respirators, safety specs, face mask, lab coat, gloves etc. **Specify which type and when they are to be worn.**	A lab coat must be warned at all times. Nitrile gloves must be worn in the preparation of all buffers.
4.4. Storage requirements Include a description of how hazardous substances including flammable materials will be stored. Describe how incompatible materials will be segregated.	Stock Ethanol is stored in the flammable shed, 20% Ethanol maybe kept in 1L Duran bottles. Buffers to be stored with clear labels in appropriate volume Duran bottles.
4.5. Transport of the hazardous substance Describe how you will transport substances between laboratories or different university sites.	Hazardous substances will not be transported outside the laboratory.
4.6. Disposal procedures Carefully consider the safest means of disposal and identify when waste should be disposed of by a chemical waste contractor	Spent buffer maybe washed down the sink with large volumes of water.

	Yes	**No**	**Describe the findings of exposure monitoring or health surveillance**
4.7. Is exposure monitoring required? For example if you suspect that exposure to a chemical exceeds the workplace exposure limit. Contact OHSS for further advice		✓	
4.8. Is health surveillance required? See Occupational Health surveillance policy and programme. Contact Occupational Health for further advice		✓	

4.9. Assessment of residual risk to human health after the application of controls (please use the risk assessment matrix at	**High**	**Medium**	**Medium/low**	**Low**
				✓

the end of this form)				

Section 5: Approval

I confirm that this is a suitable and sufficient risk assessment for the above described work activity	**Name**	**Signature**	**Date**
Assessor This is the person who has completed this form	**Johan Panek**		**05/03/2025**
Principal Investigator/responsible person	**Arnaud Basle**		

Risk estimation matrix Use this to complete sections 2.10 and 3.10

Severity of Harm	**Likelihood of harm**		
	High	**Medium**	**Low**
Severe	High	High	Medium
Moderate	High	Medium	Medium/low
Minor	Medium/low	Low	Low

Please keep a record of this risk assessment

***Review of assessment**

This assessment should be reviewed every 2 years and immediately if there is reason to believe that it is no longer valid (e.g. after an accident/incident), if there is a significant change in the work activity to which it relates or if the results of monitoring or health surveillance indicate it to be necessary.