COSHH Risk Assessment

Newcastle University

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**	Polyacrylamide gel electrophoresis		
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 buidling M3.032, M3.036		
1.5.	**Brief description of work activity**	Preparing solutions for SDS PAGE, Pouring and running gels		
1.6.	**Date of assessment**	03/03/2025	**1.7. Revision date***	dd/mm/yyyy

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. 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	X	X	X	X			

2.2. Name of hazard	**2.3. Properties of hazard** Briefly describe how the chemical is hazardous e.g. toxic, flammable, carcinogen.	**2.4. Emergency procedures**				
		Contained Spill	**Small uncontained spill**	**Large uncontained spill**	**First aid This information should be handed to Medical physician**	**Fire This information is helpful to Emergency Services**
Acrylamide/ Bis acrylamid	**Carcinogen Please see section 3.7 Mutagen**	n/a	Contain spill and soak up with absorbent material (spill pads or inert	If the entire 1L stock bottle is spilled, ALERT other	Skin contamination - remove clothing and	Special hazards arising from the substance

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		Contained Spill	**Small uncontained spill**	**Large uncontained spill**	**First aid This information should be handed to Medical physician**	**Fire This information is helpful to Emergency Services**
e 	**Reproductive toxin Neurotoxin Danger of serious damage to health by prolonged exposure through inhalation, skin adsorption and if swallowed**		granules).Put all contaminated material in a suitable container, seal and label ready for disposal via hazardous chemical waste route. Wear gloves, lab coat and safety glasses	staff to evacuate lab. Wearing appropriate PPE and 3 3M™ Half Face piece Disposable Respirator Assembly 510 reserved for these purposes clean up as for a contained spill	wash exposed area with 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.	or mixture Carbon oxides, Nitrogen oxides Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide, Nitrogen oxides (NOx),
Sodium Dodecyl Sulphate (SDS Lauryl sulphate sodium salt 	Irritant flammable	n/a	As above If cleaning up powder spill also wear FFP3 face mask.	For powder spillage ALERT other staff to evacuate the lab. Wear lab coat, gloves, safety glasses and FFP3 face mask. Contain spill and then collect and dispose as detailed above	As above	Special hazards arising from the substance or mixture Carbon oxides, Sulphur oxides, Sodium oxides Use water spray, alcohol-resistant foam, dry

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						chemical or carbon dioxide.
Ammonium persulphate 	respiratory sensitizer may cause breathing difficulties if inhaled Irritant Oxidiser may intensify fire	n/a	Wear appropriate PPE Contain spill and collect material using wet brushing and place in labelled container and dispose via hazardous waste	n/a	As above	Special hazards arising from the substance or mixture Nitrogen oxides (NOx), Sulphur oxides Container explosion may occur in a fire Firefighting measures as detailed above.
TEMED 	Highly flammable liquid and vapour Corrosive Harmful	n/a	Remove sources of ignition. Soak up with absorbent material and dispose of as hazardous waste. Wear gloves, lab coat and safety glasses Keep in suitable, closed containers for hazardous chemical waste disposal.	n/a	As above	Special hazards arising from the substance or mixture Carbon oxides, nitrogen oxides (NOx) Firefighting measures as detailed above
Isopropanol 	Flammable Irritant	In fume hood soak up with absorbent material and dispose of as hazardous	Remove sources of ignition. Soak up with absorbent material and dispose of as hazardous waste. Wear gloves, lab coat and safety glasses Keep in	n/a	As above	Special hazards arising from the substance or mixture Carbon oxides. Firefighting measures as

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		Contained Spill	**Small uncontained spill**	**Large uncontained spill**	**First aid This information should be handed to Medical physician**	**Fire This information is helpful to Emergency Services**
		waste. Wear gloves, lab coat and safety glasses Keep in suitable, closed containers for disposal	suitable, closed containers for hazardous chemical waste disposal.			detailed above.

Additional rows can be added to this table as required

2.5. 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

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.
Acrylamide / Bis Acrylamide	H302 + H332 Harmful if swallowed or if inhaled H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H340 May cause genetic defects. H350 May cause cancer. H361f Suspected of damaging fertility. H372 Causes damage to organs through prolonged or repeated exposure **Category 1B carcinogen**	Liquid only do not use Powder	40 % supplied in 1L bottles	Daily	Ingestion Inhalation Absorption Contact skin/eye
Sodium Dodecyl Sulphate (SDS)	H228 Flammable solid. H302 + H332 Harmful if swallowed or if inhaled H315 Causes skin irritation. H318 Causes serious eye damage. H335 May cause respiratory irritation. H412 Harmful to aquatic life with long lasting effects.	Powder solution	>99% 1kg 10% 500ml	Monthly Daily	As above
Ammonium persulphate (APS)	H272 May intensify fire; oxidiser. H302 Harmful if swallowed. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335 May cause respiratory irritation.	powder solution	>99% 25g 2ml 10%	Monthly Daily	As above
TEMED	H225 Highly flammable liquid and vapour. H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H332 Harmful if inhaled.	solution	25ml	Daily	As above

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Isopropanol	H225 Highly flammable liquid and vapour. H319 Causes serious eye irritation. H336 May cause drowsiness or dizziness.	Liquid	100% 100ml 100% 1L	Daily Monthly	As above
Polymerised gel	Polymerised gels are not classified as hazardous according to GHS/CLP Exposure to decomposition products may cause a health hazard The above substances will be substituted with precast gels where cost effective	solid	n/a	n/a	n/a
3.7 Carcinogens. All carcinogens and users of carcinogens should be notified to OHSS using the following link http://safety.ncl.ac.uk/carcinogenregistration.aspx					

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?		x
Will the activity involve handling or storage of pyrophoric or unstable substances such as peroxide?		x
Will flammable vapours, solid particles, fibrous particles etc. capable of forming an explosive atmosphere be present in the working atmosphere?		x
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**
	➳ Care to be taken by when chemicals are weight out – avoid inhalation of dust	➳	➳ Under careful supervision. Will not be asked to make stocks just make and run gels.	Recommend use of acrylamide pre cast gels	➳	

	Balance to be cleaned after use					

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.**	Decant isopropanol into 100 ml glass bottles in the fume hood
4.2. Administrative controls Training requirements, access control, signage, special instructions	All Staff 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 solutions will only be made when needed and at a volume that should last some time – this will reduce frequency of exposure to concentrated/neat substances All lab workers will be alerted when SDS or APS is being weighed out so that they remain a safe distance from the balance area. The amount of SDS or APS released into the air will be minimised by carefully opening the container and not making any sudden movements. Once in dilute solution these substances are deemed to pose less of a risk and a face mask is not required for the rest of the activity. Gels are assembled and poured in a designated area on a drip tray which identifies the area where carcinogens are used (acrylamide). Non-acrylamide users are excluded from this area.
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 and nitrile gloves will be worn for all parts of the experiment. Nitrile gloves are compatible with all materials used. Safety glasses will be worn for making up stocks of SDS and APS, for working with HCl and for making up the gel mix. An FFP3 face mask (3M Aura 9300+ meeting BS EN 149:2001+A1 standard) will be worn for weighing out SDS and APS. Once in solution these substances are deemed to be at lower risk and a face mask will not be work for the rest of the procedure.
4.4. Storage requirements Include a description of how hazardous substances including flammable materials will be stored safely. Describe how incompatible materials will be segregated.	Max quantities 1kg SDS, 25 ml TEMED. Stored in sealed containers in fridges or chemical shelves in lab. Stock Isopropanol will be stored in flammable bin.
4.5. Transport of the hazardous substance Describe how you will transport substances between laboratories or	Hazardous substances will not be transported outside the laboratory.

different university sites.	
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 running buffer (0.025 M Tris, 0.192 M glycine, 0.1%) SDS will be disposed of down the sink with copious amounts of water. All other surplus chemicals to be disposed by hazardous chemical waste contractor

	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			All users of Acrylamide registered as using the carcinogens but no follow up for health surveillance is required.

4.9. Assessment of residual risk to human health after the application of controls (please use the risk assessment matrix at the end of this form)	High	Medium	Medium/ low	Low
			✸	

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**		**03/03/2025**
Principal Investigator/responsible person	**Arnaud Basle**		

Risk estimation matrix Use this to complete sections 2.1

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

***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.

Please keep a record of this risk assessment