## CHEMICAL HAZARD AND RISK ASSESSMENT

### LOCATION OF THE WORK ACTIVITY
- Lab. ??

### PERSONS WHO MAY BE AT RISK
- AN Other 1, AN Other 2

### ACTIVITY ASSESSED
- Western Blotting - SDS-PAGE analysis of proteins

### MATERIALS INVOLVED

<table>
<thead>
<tr>
<th>NAME and CAS NUMBER</th>
<th>AMOUNT and FORM</th>
<th>HAZARD</th>
<th>RISK PHRASES</th>
<th>REPORTABLE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylamide /Bis-acrylamide solution</td>
<td>6ml, liquid</td>
<td>Toxic</td>
<td>May cause cancer</td>
<td></td>
</tr>
<tr>
<td>Acrylamide 79-06-1 30%</td>
<td></td>
<td>Irritant</td>
<td>May cause heritable genetic damage, Possible risk of impaired fertility</td>
<td></td>
</tr>
<tr>
<td>Bis-acrylamide 110-26-9 0.8%</td>
<td>liquid</td>
<td>Not</td>
<td>hazardous by CHIP at 0.8%</td>
<td>Yes</td>
</tr>
<tr>
<td>Ammonium persulphate 7727-54-0</td>
<td>0.05g, solid</td>
<td>Oxidizing</td>
<td>Contact with combustible material may cause fire</td>
<td></td>
</tr>
<tr>
<td>TRIS base buffer 77-86-1</td>
<td>42.6g, solid</td>
<td>Irritant</td>
<td>Irritating to eyes, respiratory system and skin</td>
<td></td>
</tr>
<tr>
<td>Hydrochloric acid 7647-01-0</td>
<td>200ml, liquid</td>
<td>Corrosive</td>
<td>Causes burns</td>
<td></td>
</tr>
<tr>
<td>Glycine 56-40-6</td>
<td></td>
<td></td>
<td>Irritating to the respiratory system</td>
<td></td>
</tr>
<tr>
<td>Sodium dodecyl sulphate 151-21-3</td>
<td>5g, solid</td>
<td>Harmful</td>
<td>Harmful if swallowed</td>
<td></td>
</tr>
<tr>
<td>Glycerol 56-81-5</td>
<td>1 ml, liquid</td>
<td>Irritant</td>
<td>Irritating to the eyes</td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol 60-20-2</td>
<td>0.5ml, liquid</td>
<td>Harmful</td>
<td>Harmful if swallowed, Irritating to eyes and skin</td>
<td></td>
</tr>
<tr>
<td>TEMED 110-18-9</td>
<td>20 μl, liquid</td>
<td>Highly flammable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corrosive</td>
<td>Causes burns</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harmful</td>
<td>Harmful by inhalation and if swallowed</td>
<td></td>
</tr>
</tbody>
</table>
If substance is reportable, have you reported it to the Health and Safety Unit? YES/NO (see Note 4)

5 **INTENDED USE and JUSTIFICATION (where appropriate)**

Give brief details and attach protocol/instructions. Justification is needed for exceptionally hazardous substances (see Note 5)

1. **Dispensing and preparation of reagents**
   - Resolving gel buffer (3M Tris): Tris base (36.6g) with Hydrochloric acid (100ml)
   - Stacking gel buffer (0.5M): Tris base (6g) with Hydrochloric acid (100ml)
   - 1.5% Ammonium persulphate (0.03g) in water (2ml)
   - 10% Sodium dodecyl sulphate (0.3g) in water (3ml)
   - Running buffer: Tris base (15g), Glycine (72g), Sodium dodecyl sulphate (5g) in water (1000ml)
   - Sample buffer: Stacking gel buffer (1.25ml), Sodium dodecyl sulphate (0.2g) in water (2ml), Glycerol(1ml), 2-mercaptoethanol (0.5ml), dH2O (0.25ml), Sprinkle of Bromophenol blue
   - Resolving gel: Acrylamide/Bis-acrylamide solution (4.17ml), 3M Tris (1.25ml), 10% Sodium dodecyl sulphate (0.1ml), water (3.98ml), TEMED (10 μl)
   - Stacking gel: Acrylamide/Bis-acrylamide solution (1.25ml), 0.5M Tris (2.5ml), 10% Sodium dodecyl sulphate (0.1ml), 1.5% Ammonium persulphate (0.5ml), water (5.65ml), TEMED (10 μl)

2. **Gel setting:** Resolving gel mix (approx. 3ml) pipetted into corner of glass plates, then space between the glasses fills with resolving gel. Distilled water (1ml) added. Gel sets in 40 min. Water removed, gel dried then chamber filled with stacking gel until it flows over. Gel sets in 40 min.

6 **RISKS to HEALTH and SAFETY from INTENDED USE**

From personal exposure or hazardous reactions. Refer to WELs, flash points, etc., as appropriate. Are pregnant women, breast-feeding mothers especially at risk?

1. Dispensing and preparation of reagents
   - Resolving gel buffer (3M Tris): Tris base is a crystalline solid – Hydrochloric acid, Exposure limit 1ppm = 0.127 cm³ liquid per 100m³ of air, fumes may irritate, serious risk from accidental skin contact with corrosive liquid; buffer mildly alkaline (pH8.8) splashing may irritate eyes.
   - Stacking gel buffer (0.5M): Tris base (6g) with Hydrochloric acid (100ml): risks as 3M Tris, but buffer nearly neutral – no risk.
   - 1.5% Ammonium persulphate risk from accidental skin contact. Only sensitisation risk from solution.
   - 10% Sodium dodecyl sulphate: risk only from accidental skin contact, solution not hazardous.
   - Running buffer: risk only from accidental skin contact with Tris base, buffer solution not hazardous.
   - Sample buffer: 2-mercaptoethanol has low vapour pressure, small risk only from accidental skin contact, buffer solution not hazardous.
   - Resolving gel: Acrylamide/Bis-acrylamide solutionons, significant sensitisation risks but only from accidental skin contact; TEMED low volatility, insignificant risk from amount used
   - Stacking gel: Acrylamide/Bis-acrylamide and 1.5% Ammonium persulphate solutions, significant sensitisation risks but only from accidental skin contact; TEMED low volatility, insignificant risk from amount used

2. Gel setting: significant sensitisation risks but only from accidental skin contact with gels before setting. No risks after washing set gels

7 **CONCLUSIONS ABOUT RISKS**

Is level of risk acceptable? Can risk be prevented or reduced by change of substance/procedure? Are control measures necessary?

Risk of inhalational and accidental skin exposure from handling large quantities of concentrated hydrochloric acid unacceptable – controls required.
Risk of accidental skin contact with sensitisers unacceptable – controls required.

8 **CONTROL MEASURES**

Additional to **Good Chemical Practice**, e.g., fume cupboard, etc. Any special requirements, e.g., glove type, etc.

Dispense concentrated hydrochloric acid in fume cupboard wear gloves PE/EVAL/PE, nitrile, neoprene or butyl rubber.
PE/EVAL/PE gloves for all other skin risks.
### INSTRUCTION/TRAINING
Specify course(s) and/or special arrangements.
Laboratory chemical safety

### MONITORING
Performance of control measures.
Fume cupboard velocity, glove condition

<table>
<thead>
<tr>
<th>Personal exposure</th>
<th>Health Surveillance, specify measures agreed with Health and Safety Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skin checks, as advised by Occupational Health</td>
</tr>
</tbody>
</table>

### WASTE DISPOSAL PROCEDURE
Include name, 6-digit code and H numbers if to be sent away for disposal
Used gels, ordinary waste.

### REVIEW
Enter the date or circumstances for review of assessment (maximum review interval 5 years)
1 year

### EMERGENCY ACTION
**TO CONTROL HAZARDS**
To stabilize situation eg spread absorbent on liquid spill; eliminate sources of ignition, etc.

Use inert spill absorbent to contain spread of spilt liquids; if available, sodium bicarbonate, sodium carbonate, calcium carbonate or lime can be used on hydrochloric acid – caution, large evolution of carbon dioxide gas
Eliminate adjacent sources of ignition if TEMED spilt.

**TO PROTECT PERSONNEL**
Evacuation, protection for personnel involved in clean-up, Special First Aid
Protect against skin and eye contact with PE/EVAL/PE gloves and goggles/face shield.

**TO RENDER SITE OF EMERGENCY SAFE**
Clean-up/decontamination
Scoop up spill absorbent.
Wash site of spill with lots of water.

### EMERGENCY CONTACT
NAME: AN Other
PHONE: 4????