

Chemical workplace assessment [Link](#)

ACTIVITY

READ THE EXERCISE INSTRUCTIONS CAREFULLY

GET AN OVERVIEW OF THE EXERCISE FROM BEGINNING TO END

RISK

FIND PROPERTIES OF HAZARDOUS SUBSTANCES

CONSIDER WHAT CAN GO WRONG IN EACH STEP IN THE WORK PROCESS

PREVENTION

DECIDE HOW TO DO THE TASK WITHOUT SOMEONE BEING INJURED

ASSESS WHAT PERSONAL PROTECTION EQUIPMENT IS NECESSARY

PREPAREDNESS

MAKE SURE YOU KNOW WHAT TO DO ABOUT ACCIDENTS AND SPILLS

KNOW THE LOCATION OF EMERGENCY EQUIPMENT

The **STOP** principle

Substitution

Technical precautions

Organisational precautions

Personal protective equipment

Activity:

Period/date: 3/3 - 2026

Project Lab Technician: Jesper Gemke

Name(s): Amalie Heltborg (Protein Frontiers)

Supervisor:

Approved: _____

1. Reagents/products (conc.) included in the activity:

A: MES

B: Tween 80

C: Ammonium sulphate

D: Sodium nitrate

Expand with D, E etc. if more.

2. Name and quantity of the substances/materials included in the individual reagents:

Reagent	Total quantity of reagent prepared ([g]/[mL]/[mol])	Compound	Quantity of individual compound used [g/mL/mol]	Substitution (STOP)	CAS No./ P-number
A: MES	20 g	MES	20 g		CAS no. 4432-31-9 P no. p202585
B: Tween 80	30 mL	Tween 80	30 mL		CAS no. 9005-65-6 P no. p201460
C: Ammonium sulphate	20 g	Ammonium sulphate	20 g		CAS no. 7783-20-2 P no. p294343
D: Sodium nitrate	20 g	Sodium nitrate	20 g		P no.: p294816 CAS no.: 7631-99-4

3. Process description (Analysis/Process: (STOP))

Detailed description/diagram of the work process that includes substances, materials and equipment that can contribute to the risk. Are there points during the procedure with higher risk (e.g. upon heating, mixing, ...)?

These are used as supplements for fermentation media and is mixed in prior to autoclaving or UV treatment. There are no specific risk points during the process.

4. Safety in preparing reagents

Find hazard labelling and waste group for the concentrated substances and materials used in preparing reagents.

Substance/product	Hazard pictogram & signal word	H-phrases	P-phrases	Waste group
MES	Non	non	non	B
Tween 80	Non	Non	Non	C
Ammonium sulphate	non	non	non	X
Sodium nitrate	 	<p>H272: May intensify fire; oxidizer.</p> <p>H319: Causes serious eye irritation.</p>	<p>P210: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.</p> <p>P220: Keep/Store away from clothing and other combustible materials.</p> <p>P280: Wear protective gloves/eye protection.</p> <p>P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P370+P378: In case of fire: Use dry powder or sand to extinguish.</p>	O



5. Prevention and preparedness when handling pure substances while preparing individual reagents/products.

Examine special precautions, personal protective equipment (**STOP**) and other preventive measures as well as emergency preparedness in case of accident/spillage/etc.

Compound/product	Prevention (Special precautions, personal protective equipment, etc.)	Preparedness
A:MES	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. <p>Do not provoke vomiting.</p> <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.
B:Tween 80	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. <p>Do not provoke vomiting.</p> <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.

	<ul style="list-style-type: none"> - fire extinguisher - Cat litter and spillage blanket 	
C: ammonium sulphate	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. <p>Do not provoke vomiting.</p> <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.
D: Sodium nitrate	<p>Wear gloves and goggles when handling.</p> <p>Avoid contact with skin and eyes.</p> <p>Keep away from fire or open flames.</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. <p>Do not provoke vomiting.</p> <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.

6. Safety in handling reagents/products

Calculate the hazard labelling for the reagents (CLP calculator, Kemibrug.dk) and find waste groups ([sorting key](#)), special conditions regarding storage are noted. Think about dangers involved in the expected reaction product.

Reagent/product	Hazard pictogram & signal word	H-phrases	P-phrases	Waste group	Storage
A: MES	Non	non	non	B	Tightly capped bottle
B: Tween 80	Non	Non	Non	C	Tightly capped bottle
C: Ammonium sulphate	non	non	non	X	Tightly capped bottle
D: Sodium nitrate		<p>H272: May intensify fire; oxidizer.</p> <p>H319: Causes serious eye irritation.</p>	<p>P210: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.</p> <p>P220: Keep/Store away from clothing and other combustible materials.</p> <p>P280: Wear protective gloves/eye protection.</p> <p>P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P370+P378: In case of fire: Use dry powder or sand to extinguish.</p>	O	Tightly capped bottle



7. Prevention and preparedness when using the individual reagent/products.

Examine special precautions, personal protective equipment (**STOP**) and other preventive measures as well as emergency preparedness in case of accident/spillage/etc. Consider, whether the required protective equipment is the same throughout the whole experiment or whether it can vary, e.g. depending on temperature.

Reagent/product	Prevention (Special precautions, personal protective equipment, etc.)	Preparedness
A:MES	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. Do not provoke vomiting. <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.
B:Tween 80	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. Do not provoke vomiting. <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the

	<p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.</p>
<p>C: ammonium sulphate</p>	<p>There is no special equipment needed, when handling the product</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. Do not provoke vomiting. <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.
<p>D: Sodium nitrate</p>	<p>Wear gloves and goggles when handling.</p> <p>Avoid contact with skin and eyes.</p> <p>Keep away from fire or open flames.</p> <p>Handle in accordance with good industrial hygiene and safety practice:</p> <ul style="list-style-type: none"> - Avoid unnecessary contact with skin and eyes. - Avoid inhalation of dust/vapours. - Ensure adequate ventilation. - Use appropriate personal protective equipment (gloves, safety glasses, lab coat, etc.). - Wash hands after handling. - Store the substance properly. - Dispose of waste appropriately. <p>Know where safety equipment is localized</p> <ul style="list-style-type: none"> - Eye washer - Emergency shower - fire hose - fire extinguisher - Cat litter and spillage blanket 	<p>First response:</p> <ul style="list-style-type: none"> - Inhalation: Remove person to fresh air. - Skin: Rinse with water. - Eyes: Rinse with eyewash. Remove contact lenses. - Ingestion: Rinse mouth and drink water. Do not provoke vomiting. <p>Contact emergency personnel in case of fainting or severe health issues</p> <p>In case of spillage:</p> <ul style="list-style-type: none"> - Powder: Use vacuum with HEPA filter to vacuum up the spilled powder - Liquid: Use sand or cat litter to soak the spillage and vacuum the litter or sand with a vacuum. Otherwise use the spillage blanket for the liquid.

8. Special risks for pregnant and breastfeeding women?

(Mandatory, if any of the following H-phrases occurs for any involved step: H350 +H351, H340 + H341, H360 + H361 + H362, H310+H311+H312, H370+H371+H372 +H373). Also mandatory, if a person involved in the work is pregnant or breast-feeding.

Is the work process/area safe for pregnant or breastfeeding women? Consider all the steps involved, including the surroundings and physical hazards like ultrasound, noise, etc.

Yes

No

Reasons:

9. Proposals for improving safety other than substitution (facultative)

What can be done to minimize the risks involved in this experiments?