Risk Assessment of Laboratory Work with Chemicals (AFS 2011:19)1 (LBE)2 (MSBFS 2020:1)3

Department/Division: **Pure and Applied Biochemistry**

Operation/Activity: **Sonication, Protein Expression and Protein Concentration Determination using the Bradford method**

The operation includes handling of the following chemicals, mixtures and solutions

	Chemical/Mixture/Solution	CAS No.	Amount	Indications of danger
1	70% ethanol	64-17-5	500 mL	Highly flammable liquid and vapour. Causes serious eye irritation.
2	Tris-HCl	1185-53-1	500 g	Not hazardous
3	100 mM IPTG	367-93-1	15 mL	Not hazardous
4	Ampicillin	7177-48-2	> 5 g	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
5	LB-media	116317	> 1 L	Not hazardous
6	PBS buffer	177629	1 L	Not hazardous
7	di-Sodium hydrogen phosphate dihydrate	10028-24-7	1 kg	Not Hazardous
8	Sodium dihydrogen phosphate dihydrate	13472-35-0	1 kg	Not Hazardous
9	NaCl	7647-14-5	1 kg	Not Hazardous
10	Imidazole	288-32-4	500 g	Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage. May damage the unborn child.
11	BSA (100 ug/ml)	9048-46-8	>10 mL	Not hazardous
12	Bradford reagent	152102	> 10mL	May be corrosive to metals. Causes severe skin burns and eye damage.

Identification of separate operations/activities that may involve the risk of accident or risk to health

	Operation/Activity	Risk/Problem	Consequence	Probability	Assessed risk	Risk-reducing measures
1	Sonication	High-frequency noise	Serious	Possible	Hazardous	Wear ear plugs/ear protection when using the sonicator.
2	Sonication	Damaging the equipment or oneself	Serious	Unlikely	Moderately hazardous	Make sure sonicator is not used dry.
3	Working with conc. ethanol	Exposure to ethanol & fire hazard	Serious	Possible	Hazardous	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Store in a well-ventilated place. Keep cool.
4	Working with ampicillin	Exposure to ampicillin	Serious	Unlikely	Moderately hazardous	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. IF ON SKIN: Wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
5	Handling imidazole	Exposure to hazardous chemical	Serious	Possible	Hazardous	Do not breathe dust. Wear protective gloves/ protective clothing/ eye protection/ face protection. IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
6	Working with bradford reagent	Exposure to bradford reagent	Mild	Unlikely	Moderately hazardous	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. Store locked up. Dispose of contents/container in accordance with local/regional/national/international regulations.

	Yes/No	Comments:
Rules for working alone has been observed	**yes**	Supervisor needs to be present at all time, no individual work allowed
The possibility of evacuation and ventilation/water/power failure has been taken into account	**yes**	Work will be stopped, flasks closed, staff will evacuate (long power outage) or wait until the power/water/ventilation will be turned on
Environmental issues have been considered	**yes**	Follow waste management rules, no concentrated substance will be poured down the drain
Special risk assessment for pregnant staff has been done	**yes**	Should not work with imidazole

References:

General safety regulations

KLARA

Date: 2026-06-17

Risk assessment made by:

Name: **Emma Esping (2025)**

Risk assessment checked by:

Name: Hamsini Bharat (iGEM 2026)

1) AFS 2011:19 Chemical Hazard in the Working Environment, provisions (amanded and reprinted in 2014:5; 2014:43; 2017:4; 2018:2; 2019:9)

2) Lag (2010:1011) om brandfarliga och explosiva varor (LBE)

3) MSBFS 2020:1 föreskrifter om hantering av brandfarlig gas och brandfarliga aerosoler

Last updated: 2026-06-17