DIENSTEN ALGEMEEN BEHEER
DIRECTIE STAFDIENSTEN ALGEMEEN BEHEER
DIENST VGM
W. DE CROYLAAN 58 – BUS 5530, BE-3001 LEUVEN
TEL. + 32 16 32 20 24 FAX + 32 16 32 29 95
WWW.KULEUVEN.BE/VGM vgm@kuleuven.be

NOTIFICATION FORM:
RISK ASSESSMENT FOR EXPERIMENT WITH CHEMICALS PRODUCTS IN HAZARD CLASS E3 EN E4

Complete the form electronically, in consultation with your specialized HSE Contact chemical safety.

1. Identification of the division (users)

Application/contact person: Ingmar Claes
Tel: 016376850 & 016327419
E-mail address: ingmar.claes@biw.kuleuven.be

Division: Biochemistry, Molecular and Structural Biology Section
Storeroom code[1]: GBM1 - Afdeling Biochemie, Moleculaire en Structurele Biologie - Johan Robben
Head: Marc De Maeyer
Head of lab: Johan Robben

2. Identification of the experiment

Title(name): Agarose gel electrophoresis
Start date: 01/07/2013 Planned end date: continuous

☐ New experiment
☐ Existing experiment without prior risk assessment
☒ Modification/expansion of an existing experiment with prior risk assessment
This modification/expansion concerns (please indicate and describe in the form):
☐ persons
☐ rooms of the experiment
☐ chemicals products
☐ other risks
☐ prolongation
File number or reference number previous advice: ☐ (if known)

☒ If HSE FILE available:
☒ experiment in the context of an existing activity
Give the number of the activities: 615 -- OG Eiwitinteracties -- DNA/RNA-manipulaties
This RA deals with a new activity (in consulation with specialised HSE Contact and head of division[1]):false
Give the title of the new activity for the HSE-file:

☐ Continuous tests (**unattended** activity within or outside working hours)

[1] https://admin.kuleuven.be/vgm/intranet/doc/antenne/antennemagazijncodes.xlsx/view[1]

Description of the chemicals used (or formed)*

Product name	Cas number	Physical state (solid/liquid/gas)	Quantity used	Concentration used	Chemical hazard class (E4/E3/E2/E1)
1. Tris(hydroxymethyl) amino methane	77-86-1	solid	5 L/year	40 mM in electrophoresis buffer; 10 mM in GeneRuler 100 bp DNA Ladder	E1
2. Acetic acid	64-19-7	liquid	50 mL/year	Adjusted pH in electrophoresis buffer	E3
3. EDTA	60-00-4	solid	5 L/year	1 mM in electrophoresis buffer; 60 mM in GeneRuler 100 bp DNA Ladder	E1
4. Hydrogen chloride	7647-01-0	liquid	50 µL/year	Adjusted pH in GeneRuler 100 bp DNA Ladder	E3
5. Xyleencyanol	4463-44-9	solid	50 µL/year	0,03% in GeneRuler 100 bp DNA Ladder	E1
6. Ethidium bromide	1239-45-8	solid	250 mL/year	1 µg/mL	E4 with
7. Bromophenol blue	115-39-3	solid	250 µL/year	0.005 % in GeneRuler 100 bp DNA Ladder; 0.25 % in 5X loading dye	E0
8. Glycerol	56-81-5	solid	50 µL/year	10 % in GeneRuler 100 bp DNA Ladder	E0
9. Sucrose	57-50-1	solid	200 µL/year	40 % in 5X loading dye	E0
10. Agarose	9012-36-6	solid	100 g/year	1 % agarose gel (TAE buffer)	E0

* If possible, replace highly hazardous products or processes by less hazardous ones !

Location of experiment

Building	Room	Description of subactivity (eg. preparation, experiment, follow-up, measurement,…)	Room specifications
492.11	02.67	1. preparation	☒ within your own division ☐ allocated to another division
492.11	02.67	2. experiment	☒ within your own division ☐ allocated to another division
492.11	02.12	3. visualization of the DNA fragments	☒ within your own division ☐ allocated to another division

* If experiments are conducted in a room allocated to another division, please send also the notification form to this head of division (in copy).

Persons who conducting the experiment or for a practical the supervisors

Name – first name	Birth date	Staff category
Ingmar Claes	**04/05/1084**	☒ KU ☐ Student KU ☐ UZ ☐ VIB ☐ Externals:

ASSOCIATIE K.U.LEUVEN

PhD students from the Biochemistry, Molecular and Structural Biology section; **Students from the IGEM team**		☒ KU ☒ Student KU ☐ UZ ☐ VIB ☐ Externals:

3. Description experiment and risk assessment

Description of handling and techniques:

Number* of sub-experiment	**Description of handling and techniques**	**Equipment used**	**Numbers ** of products used**
1	Preparation: Prepare the electrophoresis buffer, the gel and tracking dye for the experiment.	Lab coat, safety glasses and gloves Microwave, autoclave, …	1, 2, 3, 7, 9, 10
2	The experiment: When DNA fragments are submitted to an electric field, they migrate towards the anode (+ pole). Since they have the same charge density, fragments with similar conformation can be separated in function of their size by gel electrophoresis.	Lab coat, safety glasses and gloves Horizontal gel electrophoresis unit, power supply, …	1, 2, 3, 4, 5, 7, 8, 9, 10
3	Visualization of the DNA fragments by staining with EtBr: Place the gel in an EtBr solution for 20 min and inspect on an UV transilluminator (excitation wavelength 365 nm).	Lab coat, safety glasses and gloves UV transilluminator, camera, …	1, 2, 3, 6

* Number of the subactivity as indicated under “Location of experiment”

** Number of the chemicals as indicated in “Description of the chemicals used (or formed)”

Frequency of the experiment:

☒ Daily
☐ Weekly
☐ Monthly
☐ Less than monthly

Optionally, more information about the experiment can be added (eg. reaction scheme)

ASSOCIATIE K.U.LEUVEN

Risks associated with the chemicals

Before handling chemicals, identify their hazards (R or H and S or P phrases)!

These can be found in the K.U.Leuven database of hazardous substances (via KULoket, General, Hazardous materials) or in the manufacturer's safety data sheets.

In the table below, indicate the hazards of the products in risk class E3 and **E4**.

Name of chemical	Acetic acid	Hydrogen chloride	Ethidium bromide				
Explosion and fire hazard							
Extremely or highly flammable (**H220, H222,224, H228,** H225) / (R11,R12)	☐	☐	☐	☐	☐	☐	☐
Flammable gas, aerosol, solid (H221, H223**, H228**)	☐	☐	☐	☐	☐	☐	☐
Self heating, my catch fire **(H251,H252)**	☐	☐	☐	☐	☐	☐	☐
Fire, explosive – projection hazard (H204, **H202**, **H203**), Mass explode in fire (H205)	☐	☐	☐	☐	☐	☐	☐
Explosive (**EUH001, EUH006, H200, H201**) /(**R1,R2,R3**,R5) +combustible materials (H271, H272)/(R9) + T↑(H240, H241), sealed and T↑ (EUH044) /(R44)	☐	☐	☐	☐	☐	☐	☐
Flammable vapour-air mixture (EUH018)	☐	☐	☐	☐	☐	☐	☐
Explosive peroxides (EUH019)	☐	☐	☐	☐	☐	☐	☐
Incompatible with water (EUH014, H260) /(R14,R15)	☐	☐	☐	☐	☐	☐	☐
Catches fire spontaneously if exposed to air **(H250)**	☐	☐	☐	☐	☐	☐	☐
Explosive + metals (R4) + O2 **(R6**)	☐	☐	☐	☐	☐	☐	☐
Incompatible with oxidizing materials (R16)	☐	☐	☐	☐	☐	☐	☐
Unstable product (**R17**, R18, R19)	☐	☐	☐	☐	☐	☐	☐
Acute health hazard							
Highly toxic (**H300, H330, H310**) / (**R26, R27, R28**) + acid (EUH032)/ (R32) Toxic (H311, H331, EUH070) / (R23, R24) + water (EUH029) / (R29) + acid (EUH031) / (R31)	☐	☐	☒	☐	☐	☐	☐
Sever burns (H314) / (R35)	☒	☒	☐	☐	☐	☐	☐
Long-term health hazard							
Carcinogenic or possible carcinogenic (**H350, H350i, H351**) / (**R40, R45, R49**)	☐	☐	☐	☐	☐	☐	☐
Teratogenic (H361d, **H360D**) / (**R61**, R63) and harmful to fertility (H361f, **H360F**) / (**R60**, R62) , both hazards (H361fd, **H360FD, H360Df**, **H360Fd)**	☐	☐	☐	☐	☐	☐	☐
Mutagenic (H341, **H340**) / (**R46**)	☐	☐	☒	☐	☐	☐	☐
Damage to certain organs (H371, H372, **H370**) through prolonged or repeated exposure (H373)	☐	☐	☐	☐	☐	☐	☐
Severe irreversible effects (possible) (R39, R68), Health damage after prolonged exposure (R48)	☐	☐	☐	☐	☐	☐	☐

Additional remarks for certain products:

Other risks associated with the experiment

☒ Burning, freezing (☐ high or low temperatures, ☐ cryogenic materials, …)
☒ Implosion, explosion (☐ high pressure, ☐ low pressure, ☐ underpressure, …)
☐ Fire (☐ ovens, ☐ heating spirals, ☐ bunsen burner, ☐ oil baths, …)
☒ Non-ionizing radiation (☐ NMR, ☐ lasers, ☐ UV-lamps, ...)
☒ Elektrocution (☐ unproteced outlets, ☐ humid environment, ☐ high voltage, ...)
☐ Unattended operation (☐ remote room, ☐ outside working hours, ...)
☐ Risk of falling (☐ set-ups at height, ☐ at height, ☐ hard to reach places, ...)
☐ Biosafety risk (☐ pathogenic µ-organisms, ☐ GGO, ☐ cells, ☐ blood, ☐ laboratory animals, ...)
☐ Ionizing radiation (X-rays, isotopes, ...)
☐ In case of a serious incident, asking for help may NOT be possible (ex. Use of toxic gasses or vapours, risk of explosion, presence of inert gases in the lab, …)
☐ Other:

Precautionary measures

Number of subexperiment*	1	2	3	4	5
Collective protective equipment					
- Closed system	☒	☒	☒	☐	☐
- Fume cabinet	☐	☐	☒	☐	☐
- Local ventilation	☐	☐	☐	☐	☐
- General ventilation	☒	☒	☒	☐	☐
- Safety screen	☐	☐	☒	☐	☐
- Waste containers	☐	☒	☒	☐	☐
- Other:	☐	☐	☐	☐	☐
Personal protective equipment					
- Laboratory coat	☒	☒	☒	☐	☐
- Safety glasses	safety spectacles (artno. 18042)	safety spectacles (artno. 18042)	safety spectacles (artno. 18042)	Choose an item	Choose an item
- Gloves:	Disposable safety floves nitrile EN 374 (artno. 58951)	Disposable safety floves nitrile EN 374 (artno. 58951)	Disposable safety floves nitrile EN 374 (artno. 58951)	Choose an item	Choose an item
- Masks:	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item
- Disposable cleanroom cap	☐	☐	☐	☐	☐
- Other	☐	☐	☐	☐	☐

Specific precautionary measures

☒ checking the functioning of the fume cabinet
☒ checking glassware for cracks
☐ attaching clamp rings to cooling hoses
☐ overpressure protection
☒ presence of a fire extinguisher for metal fires (Class Dextinguisher)
☐ presence of an oxygen pack (required when handling cyanides)
☐ detector alarm when handling toxic or combustible gasses
☐ presence of a gas mask with specific filters (intervention)
☐ presence of a calcium gluconate ointment (handling hydrogen acid)

ASSOCIATIE K.U.LEUVEN

☒ presence of an intervention kit *i.e.* 492.11-02.corridor (decontamination solution)
☐ Check the **Hazardous Laboratory Chemicals Disposal Guide**
☐ completing and submitting the continuous tests form:
https://admin.kuleuven.be/vgm/intranet/EN/Documents/unattendedexp.doc
☐ check for incompatible reagent combinations in the **Incompatibility table** available via
https://www.groupware.kuleuven.be/sites/depchemrisico/Safety%20information/Incompatibility%20table.pdf
☒ check for incompatible reagent combinations: **Bretherick's Handbook of Reactive Chemical Hazards**
http://metalib.libis.be:8331/V/?func=find-db-info&doc_num=000002419
☒ Applying the Code of Good Laboratory Practice
https://admin.kuleuven.be/vgm/intranet/ChemischeVeiligheidCodeGoedeLabopraktijken.html)
☒ Internal training and guidance
☒ Selective waste collection – chemical waste

Special precautionary measures in case of failure
Describe the actions needed in case of emergency (e.g. malfunctioning of electricity, ventilation, water supply, gas supply, compressed air, ...)

* Number of the subexperiment as indicated under "Location of the experiment"

The experiment may not start, if all the precautionary measures can't be applied!
Personal protective equipment can be obtained via this request form:
https://admin.kuleuven.be/vgm/intranet/EN/Documents/requestformindividualprotectiveequipment.doc

Chemical waste
Indicate the waste category of each waste fraction.

Waste fraction	**Waste category**	**Available container**
If pure substances:		
Ethidium bromide	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☒5 - ☐ 6 - ☐ Other	☒
Solid waste (tips, tubes, …)	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☐5 - ☐ 6 - ☒ Other: cordi box	☒
Gels (stained)	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☐5 - ☐ 6 - ☒ Other: yellow container 30 L	☒
Electrophoresis buffer	☐1 - ☐2 - ☒ 3 - ☐ 4 - ☐5 - ☐ 6 - ☐ Other	☒
	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☐5 - ☐ 6 - ☐ Other	☐
If mixtures:		
Main component : with	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☐5 - ☐ 6 - ☐ Other	☐
Other:		
	☐1 - ☐2 - ☐ 3 - ☐ 4 - ☐5 - ☐ 6 - ☐ Other	☐

Comments / questions:

Deliver this form to your specialised HSE-contact.

The specialised HSE-contact sends this notification to the HSE-Department if products of Class E4 with clearance are involved.

ASSOCIATIE K.U.LEUVEN