Risk assessment
4-Nitroquinoline *N*-oxide
CAS-no: 56-57-5
Synonyms: 4-NQO
Formula: $C_9H_6N_2O_3$
Molecular weight: 190,16 g/mol
Appearance: yellow crystal
Description: Skin and lung tumor initiator under experimental conditions.
Storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Recommended storage temperature: -20 °C
Hazardous decomposition products: Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)
Hazards identification: Use with caution, Risk to man and the environment and also may cause cancer.

Handling: Avoid exposure - obtain special instructions before use. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection

First aid measurements:
If inhaled: If breathed in, move person into fresh air.
In case of skin contact: Wash off with soap and plenty of water.
In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes.
If swallowed: Never give anything by mouth to person. Rinse mouth with water. Consult a physician.

Protection:
Hand protection: Handle with gloves.
Eye protection: Safety glasses with side-shields
Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Use virkon to neutralize activity.

More information at: http://www.aniara.com/pdf/MSDS-APPC-4NQO.pdf

Risk assessment
Acrylamide (Sigma Aldrich A9099)

Synonyms: Acrylic acid amide 2-Propenamide
CAS-no: 79-06-1
Appearance: Clear colorless liquid or solid crystals.
Storage: Cool, dry and well ventilated. Keep the container tightly closed.
Molecular formula: C3H5NO
Molecular weight: 71,08 g/mol

Description:
Bio-Rad's acrylamide/bis solutions are made from 99.9% pure acrylamide and bis-acrylamide and are available in two concentrations, 30% and 40%, and three different crosslinker ratios, 19:1, 29:1 and 37.5:1. Acrylamide/bis solutions are provided ready to use and come with instructions. High-purity reagents and carefully controlled manufacturing conditions allow acrylamide/bis solutions to be stable for 1 year at 4 °C.

Main use:
Polyacrylamide is a commonly used electrophoresis matrix formed by free-radical polymerization of acrylamide and a co-monomer crosslinker. Reliable electrophoresis results depend on the reproducibility of this reaction,[1–4] making highly-purified starting reagents an important factor in gel quality

Hazards identification:
Toxic if swallowed.
May cause genetic defects.
May cause cancer.
Suspected of damaging fertility.
Causes damage to organs through prolonged or repeated exposure.
Harmful in contact with skin.
Harmful if inhaled.
Causes skin irritation.
Causes serious eye irritation.
May cause an allergic skin reaction

Precautionary safety measurements upon handling:
Wear nitrile gloves, lab coat and respiratory protection when using powder (for liquid gloves and lab coat is enough). Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING. Call for medical help immediately. Consult a physician.
IF BREATHED IN: Remove breathing apparatus only after contaminated clothing have been completely removed. In case of irregular breathing or

respiratory arrest provide artificial respiration. After inhalation Supply fresh air or oxygen; call for doctor.
IN CASE OF SKIN CONTACT: After skin contact immediately wash with water and soap and rinse thoroughly.
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes as a precaution and consult a physician.

Symptoms and effects (acute and delayed):
Consult physician anyways.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. THROW THE CONTENTS IN YELLOW BIOLOGICAL WASTE BOX.

Risk assessment
Actinomycin D (Sigma Aldrich A9415)

Synonyms: Dactinomycin, Actinomycin IV, Actinomycin C_1, Cosmegen
CAS-no: 50-76-0
EC-no: 200-063-6
Appearance: Red powder crystals or clear yellow liquid.
Storage: 2-8°C or -20°C. Protect from light and moisture.
Molecular formula: $C_{62}H_{86}N_{12}O_{16}$
Molecular weight: 1255.42

Description: Actinomycin D is a polypeptide acting as an antineoplastic antibiotic that inhibits cell proliferation. It functions by forming a stable complex with double stranded DNA, thereby inhibiting transcription and replication, as well as causing double stranded DNA breaks.

Main use: Inhibitor of spurious second strand cDNA synthesis during reverse transcription by the DNA dependent DNA polymerase activity of reverse transcriptase.

Hazards identification:
Very toxic/lethal if swallowed.
May be harmful if inhaled. May cause respiratory tract irritation.
May be harmful if absorbed through skin. May cause skin irritation.
May cause eye irritation.

Acute toxicity, Oral (Category 2).
Mutagenic effects.
Not classifiable as to its carcinogenicity to humans (IARC group 3).
Overexposure may cause reproductive disorders.
Prolonged or repeated respiratory or skin exposure may cause allergic reactions in certain sensitive individuals.

Precautionary safety measurements upon handling:
Do not swallow.
Do not breathe dust, vapors, mist or gas. Ensure adequate ventilation. Wear respiratory protection and avoid dust/aerosol formation.
Avoid contact with skin, eyes and clothing. Wear suitable protective clothing, including face shield/safety glasses, chemically resistant gloves and lab coat.
Wash hands thoroughly after handling.

First aid measurements:
IF SWALLOWED: Immediately consult a physician and Giftinformationscentralen. Rinse mouth by water. Remove any dental prostheses. Move the person to fresh air and into a position that eases breathing. If the person is conscious and not feeling sick, give small amounts of water to drink. Never give anything by mouth if the person is unconscious. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing.

IF BREATHED IN: Move the person to fresh air and into a position that eases breathing. If the person is not breathing, give artificial respiration. Note that mouth-to-mouth contact can be dangerous to the person giving it. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing. Consult a physician. If decomposition product released upon fire has been inhaled the effects may be delayed.

IN CASE OF SKIN CONTACT: Wash immediately with plenty of soap and water. Remove contaminated clothing. Consult a physician. Clean contaminated clothing before use.

IN CASE OF EYE CONTACT: Flush eyes with plenty of water for at least 10 minutes as a precaution. Lift upper and lower eyelid occasionally. Remove contact any lenses. Consult a physician if irritation occurs.

Symptoms and effects (acute and delayed):
Anemia, drowsiness, weakness.

Pharmacokinetics: Half-life 36 h.

Waste handling: Offer surplus powder, solutions and contaminated packaging to a licensed disposal company. Dissolve or mix with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Risk assessment
Ammonium persulfate (APS) (Sigma Aldrich A3678)

Synonyms: AP APS Ammonium peroxodisulfate Ammonium peroxydisulfate PER

CAS-no: 110-18-9
Appearance: White powder.
Storage: Cool, dry and well ventilated. Keep the container tightly closed.
Molecular formula: H8N2O8S2
Molecular weight: 228,20 g/mol

Description:
Tested for use in acrylamide polymerization.

Main use:
Ammonium persulfate forms oxygen free radicals in aqueous solution by a base-catalyzed mechanism[1]. The bases most commonly used as catalysts are tertiary amines such as N,N,N′,N′-tetramethylethylenediamine (TEMED) or 3-dimethylaminopropionitrile (DMAPN). The free radicals will cause acrylamide and bis-acrylamide to polymerize to form a gel matrix, which can be used for separating macromolecules by size.

Hazards identification:
May intensify fire; oxidiser. Harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties. May cause respiratory irritation.

Precautionary safety measurements upon handling:
Keep/Store away from clothing/ combustible materials. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. Wear protective gloves.

First aid measurements:
IF SWALLOWED: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
IF BREATHED IN: If breathed in, move person into fresh air. If not breathing, give artificial respiration. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ Consult a physician.
IN CASE OF SKIN CONTACT: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.
IN CASE OF EYE CONTACT: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Symptoms and effects (acute and delayed):
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Waste handling:

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. THROW THE CONTENTS IN YELLOW BIOLOGICAL WASTE BOX.

Risk assessment

2-Mercaptoethanol

Synonyms: beta-Mercaptoethanol; 2-Hydroxyethyl Mercaptan; 2-Hydroxyethanethiol; Thioglycol.

CAS NO- 60-24-2

Appearence: clear, colorless liquid.

Molecular formula: C_2H_6OS

Molecular weight: 78.13

Flammability of the Product: Combustible liquid.

Flash Point: 73.9 ^{o}C.

Auto-Ignition Temperature: 295 °C

Flammable Limits: 2.3 - 18%

Storage: Store at room temperature. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and open flame. Moisture sensitive.

Incompatible Products: Strong oxidizers. Metals.

Hazard identification

Warning! May be fatal if absorbed through the skin. Causes severe eye irritation. Harmful if swallowed. Stench. Rapidly absorbed through skin.

Combustible liquid and vapor. May cause skin and respiratory tract irritation.

Target Organs: Central nervous system, respiratory system, eyes.

Potential Health Effects

Eye: May cause severe eye irritation. May result in corneal injury.

Skin: May be fatal if absorbed through the skin. May cause irritation with burning pain, itching and redness.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause muscle paralysis, respiratory failure, and possible death.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. May cause dyspnea (difficult or labored breathing). Exposure to high concentrations of mercaptans can produce unconsciousness with cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), cold extremities and rapid pulse. Mercaptans may cause nausea and headache.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. Repeated or prolonged exposure may cause CNS stimulation.

Accidental release measures

Methods for cleaning up

Spill : Stop leak if without risk. Evacuate area. Move containers from spill area. Contain and collect spillage with non-combustible, absorbent material e.g. sand, vermiculite and place in container for disposal. Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product. Ventilate area and wash spill site after material pickup is complete.

Precautionary safety measurements upon handling:

Handling Procedures and Equipment: **COMBUSTIBLE, VERY TOXIC, VERY IRRITATING.** Use smallest amount possible for the purpose in an area with appropriate ventilation. Avoid generating vapour or mist. Avoid all contact with eyes, skin or clothing. Avoid inhalation. Keep away from all incompatible and combustible materials. Keep containers closed when not in use. Empty containers may contain hazardous residues; treat with caution.
Engineering Controls: Non-sparking, grounded ventilation system, separate from other ventilation systems, and electrical equipment that does not provide a source of ignition.
Respiratory Protection: Dust/mist mask. Fumehood.
Eye Protection: Chemical safety goggles, face shield.
Skin Protection: Polyvinil gloves. Splash contact nitrile-rubber gloves(0.4 mm, break-through time>120 min.
Other Personal Protective Equipment: Safety shower and eye-wash fountain in work area.

First aid measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: **Do not induce vomiting.** If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.
Most important symptoms and effects: both acute and delayed burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Weakness, Unconsciousness, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema

Emergency phone: Giftinformationscentralen 112

Fire fighting measures

Extinguishing media: Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.
Special hazards arising from the substance or mixture
Carbon oxides, Sulphur oxides
Waste treatment methods
Product: Dilute and flush to an approved wastewater treatment system. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a

licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Contaminated packaging: Dispose of as unused product.

Toxicological information
CAS# 60-24-2: KL5600000
LD50/LC50:
CAS# 60-24-2:
Dermal, guinea pig: LD50 = 300 uL/kg;
Draize test, rabbit, eye: 2 mg Severe;
Inhalation, mouse: LC50 = 13200 mg/m3;
Oral, mouse: LD50 = 190 mg/kg;
Oral, rat: LD50 = 244 mg/kg;
Skin, rabbit: LD50 = 150 uL/kg;
.

Carcinogenicity:
CAS# 60-24-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Cytogenetic Analysis: human leukocyte 100uL/L DNA Damage: microorganisms 10mmol/L DNA Inhibition: rat liver 1mmol/L Unscheduled DNA Synthesis: mouse cell types 30mmol/L
Neurotoxicity: No information available.

For more information
http://fscimage.fishersci.com/msds/13740.htm

Risk assessment
Chloroform (Sigma Aldrich 496189)

Synonyms: Trichloromethane, Methylidyne trichloride
CAS-No.: 67-66-3
Appearance: clear, colourless liquid
Storage: store in dry and well-ventilated place
Formula : $CHCl_3$
Molecular Weight : 119.38

Description / Main use: Chloroform is used for purification of nucleic acids from organic impurities and protein.

Hazards identification:
Harmful if swallowed.
Irritating to skin.

Acute toxicity, Oral (Category 4)
Skin irritation (Category 2)
Carcinogenicity (Category 2)
Specific target organ toxicity - repeated exposure (Category 2)

Precautionary safety measurements upon handling:
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Wear tightly fitting safety goggles and face shield.
Handle with appropriate gloves (disposable nitrile gloves).
Wear lab coat.

First aid measurements:
IF SWALLOWED: Immediately consult a physician and Giftinformationscentralen. Rinse mouth by water. Remove any dental prostheses. Move the person to fresh air and into a position that eases breathing. If the person is conscious and not feeling sick, give small amounts of water to drink. Never give anything by mouth if the person is unconscious. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing.

IF BREATHED IN: Move the person to fresh air and into a position that eases breathing. If the person is not breathing, give artificial respiration. Note that mouth-to-mouth contact can be dangerous to the person giving it. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing. Consult a physician. If decomposition product released upon fire has been inhaled the effects may be delayed.

IN CASE OF SKIN CONTACT: Take off contaminated clothing and shoes immediately. Wash immediately with plenty of soap and water.. Consult a physician. Clean contaminated clothing before use.

IN CASE OF EYE CONTACT: Flush eyes with plenty of water for at least 15. Lift upper and lower eyelid occasionally. Remove contact any lenses. Consult a physician if irritation occurs.

Waste handling: Collect excess liquid and contaminated materials in the containers marked ‘Phenol waste’ in the fume hood.

Cyclohexamide
CAS Number 66-81-9

Labelling according Regulation (EC) No 1272/2008 [CLP]
Signal word Danger

Hazard statement(s)
H301 Toxic if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H341 Suspected of causing genetic defects.
H360D May damage the unborn child.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P281 Use personal protective equipment as required.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/
physician.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove
contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Precautions for safe handling
Avoid exposure - obtain special instructions before use.Avoid contact with skin and eyes. Avoid inhalation
of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic
charge.

Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are
opened must be carefully resealed and kept upright to prevent leakage.
Recommended storage temperature: 2 - 8 °C
Hygroscopic.

ACCIDENTAL RELEASE MEASURES
Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove
all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form
explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter

drains. Discharge into the
environment must be avoided.

Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and
place in container for disposal according to local regulations (see section 13). Keep in suitable, closed
containers for disposal.

Description:

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under
appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique
(without touching glove's outer surface) to avoid skin contact with this product. Dispose of
contaminated gloves after use in accordance with applicable laws and good laboratory practices.
Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected
according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator
with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup
to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air
respirator. Use respirators and components tested and approved under appropriate government
standards such as NIOSH (US) or CEN (EU).

Risk assessment
Diethyl pyrocaarbonate (Sigma Aldrich D5758)
CAS-no: 1609-47-8
Synonyms: DEPC, DEP,Ethoxyformic acid anhydride, Diethyl oxydiformate

Appearance: Clear colorless liquid.
Storage: Sensitive to moisture and will give of CO2 when reacting with water, incompatible with polycarbonate containers. Store at 2-8°C. Handle under Argon.
Molecular formula: C6H10O5
Molecular weight: 162.1

Description:
DEPC is a nonspecific nuclease inhibitor. It reacts with the –NH, -SH and –OH groups present at the active site of many enzymes.

Main use:
DEPC is used as a RNase inhibitor, often to prepare RNase free solutions.

Hazards identification:
DEPC is harmful for both humans and the environment. Irritant of eye, skin and respiratory tract, acutely toxic upon ingestion. Reacts with Ammonia to form Urethane, a possible carcinogenic

Harmful if swallowed.
Harmful if inhaled
Harmful in contact with skin.
Risc of serious damage to eyes.

Precautionary safety measurements upon handling:
Avoid contact with skin or eyes.
Do not inhale vapour or ingest.
Keep away from sources of ignition.
Wash hands after use.
Use face protection, gloves and protective clothes.

When making DEPC-treated solutions, pressure may build up from released CO^2. Open bottles carefully in fumehood or incubate them in fumehood with cap slightly open.

Some plastic pipettes way melt in contact with DEPC. Use glass.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING, unless instructed to do so by medical personnel. Rinse mouth with water. Never give anything by moth to an unconscious person. Consult a physician.
IF BREATHED IN: Move to fresh air. If not breathing, give artificial respiration. Consult a physician immidiately.

IN CASE OF SKIN CONTACT: Immediately flush with plenty of water for at least 15 min. Call a physician.
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes, also under eyelids. Remove contact lenses if possible. Call a physician immediately.

Symptoms and effects:
unknown

Waste handling:
Combustible and may be burned. DEPC hydrolyses to ethanol and carbon dioxide in aqeous solutions and solutions can be autoclaved or boiled to deactivate DEPC (which is the general procedure when treating solutions).

Risk assessment
Dimethyl sulfoxide (Sigma Aldrich D8418)

Synonyms: DMSO, Methylsulfoxide
CAS-no: 67-68-5
Appearance: Clear colorless liquid.
Storage: Cool, dry and well ventilated. Keep the container tightly closed.
Molecular formula: C_2H_6OS
Molecular weight: 78.13

Description:
DMSO is an organic solvent that dissolved both polar and nonpolar substances and is miscible in many organic solvents as well as water.

Main use:
DMSO is used as a solvent for various compounds. It can be used in PCR to inhibit secondary structures in DNA template and primers. It can also be used as a cryoprotectant.

Hazards identification:
DMSO has low toxicity in itself. Avoid contact with DMSO solutions containing toxic materials as DMSO is readily absorbed through skin and may carry such materials into the body.

May be harmful if inhaled. High vapor concentrations may cause respiratory tract irritation, headache, dizziness, and sedation.
May be harmful if swallowed.
May be harmful if absorbed through skin. May cause skin irritation, with stinging and burning of the skin as well as rashes and vesicles. A heat reaction may occur if applied to wet skin.
May cause eye irritation.

Liquid and gases are combustible.

Precautionary safety measurements upon handling:
Keep away from sources of ignition.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes, or clothing. Use safety glasses, protective gloves and impervious clothing. Nitrile gloves may dissolve in DMSO.
Wash and dry hands after use.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING. Rinse moth with water. Never give anything by moth to an unconscious person. Consult a physician.
IF BREATHED IN: Move the person to fresh air. If not breathing, give artificial respiration. Consult a physician.
IN CASE OF SKIN CONTACT: Wash off with soap and plenty of water. Remove contaminated clothing and wash before reuse. Consult a physician if irritation persists.

IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes as a precaution. If irritation persists, consult a physician.

Symptoms and effects (acute and delayed):
Nausea, fatigue and headache after ingestion.

Waste handling:
Dilute and flush to an approved wastewater treatment system. Offer surplus and contaminated packaging to a licensed disposal company. DMSO is combustible and may be burned in a chemical incinerator equipped with an afterburner and scrubber.

Risk assessment and instructions for work with ethidium bromide or SYBR

Identifiers

CAS number 1239-45-8

Main use: Fluorescence labelling of nucleic acids on agarose or acrylamide gels. Use preferably SYBR (like Invitrogen SYBR safe DNA stain) or corresponding products from other manufacturers, since they are less hazardous than ethidium bromide. If ethidium bromide is needed a stock solution of ethidium bromide (typically 10 mg/ml) is prepared by dissolving tablets (available in the chemical storage room, 7D21:11) in water. This stock solution is diluted approximately 10 times and the final concentration when treating gels is 1 μg/ml or less.

Hazard identification: Irritating, mutagenic, probably inducer of reproductive toxicity and possibly carcinogenic, although no such data are available.

Risk assessment: Primarily because of its mutagenic and probable reproduction toxic properties, ethidium bromide and SYBR should be handled with care. Very low concentrations of ethidium bromide or SYBR are used when labelling nucleic acids and if gloves are used the exposure to ethidium bromide or SYBR is very small and the risk of adverse health effects is probably small compared to other risks. However, contamination of surfaces in the lab could be significant and thus exposing hands of people not wearing gloves.

Safety measures:

- Use gloves (it is possible that ethidium bromide and SYBR will pass latex gloves, but not nitrile gloves. Vinyl gloves have not been tested as far as we know)
- Use only ethidium bromide tablets since that will reduce exposures
- Label all solutions and collect all waste
- If possible, do the staining of the gel afterwards (not when casting), since that will reduce exposure and contamination.
- Use some kind of designated tray or box to carry the stained gel in, e.g. when bringing it for documentation.
- It is advised to use a slice when moving gels from and to trays and boxes and not touch it at all with hands. One could use one of those Teflon spatula you use at home when frying (use two for large gels or buy a designated one from a supplier of electrophoresis equipment).
- Discard contaminated gloves. If you don't use a spatula when moving gels it is unavoidable that gloves are contaminated and you should not spread this contamination to other surfaces. This is particularly important when checking and photographing the gels in UV-light.
- Photo documentation of ethidium bromide or SYBR stained gels are done with the Gel Doc equipment in rooms 6L16:16 (responsible Åsa Bergström), 7D16:08 (responsible Hanna Peterson), 6D23:04 (floor 6, responsible, Richard Nordström) or 6D11:14 (MNL, responsible Anne Marie Witte). Contact the responsible person before using the equipment. These rooms

should be considered as ethidium bromide and SYBR contaminated. Nitrile gloves should be used when you are exposed to UV or concentrated ethidium bromide or SYBR (or similar) solutions. Vinyl gloves will be sufficient for other applications such as touching spatulas, benches and computers. Make sure that you discard the gloves in that room and are not bringing them to other areas.

Waste handling: Stock and other solutions can be destroyed by adding activated charcoal or alternative methods (see Sambrook et al., Molecular Cloning, section 1.49 (in the 2nd edition)) and thereby reducing the amount of waste. If collecting larger volumes of ethidium bromide or SYBR contaminated buffer one could use e.g. an immiscible pump for fish tanks to filter the buffer through charcoal (ask someone in HGA group for more details). The deactivated solutions can be poured out into the sink in the hood and the charcoal, gels and all not deactivated solutions are collected in plastic containers. Affix a label, fill in requested information and deposit the container in the storage for chemical waste on floor 2 (see app. 2).

Risk assessment
Formaldehyde Solution (36.5-38%) (Sigma Aldrich F8775)

Synonyms: methanal, formalin, formic aldehyde, methaldehyde, methyl aldehyde, methylene oxide, oxomethane, and oxymethylene.
CAS-no: 50-00-0
Appearance: Clear colorless liquid.
Storage: Cool, dry and well ventilated. Keep the container tightly closed.
Molecular formula: CH_2O
Molecular weight: 30.03

Description:
Formaldehyde Solution is a highly reactive gas in aqueous solution with a characteristic pungent odor.

Main use:
Formaldehyde has many uses in molecular biology, including as a fixative and preservative, crosslinking nitrogen-containing molecules and denaturing RNA for gel electrophoresis.

Hazards identification:
Formaldehyde Solution is acutely toxic by inhalation, skin contact and swallowing.
Danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
Causes severe skin burns and eye damage.
Limited evidence of carcinogenic effect.
May cause an allergic skin reaction.
Causes damage to organs.

Liquid and gases are highly flammable.

Precautionary safety measurements upon handling:
Keep away from sources of ignition.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes, or clothing. Use safety glasses, nitrile gloves and impervious clothing.
Wash and dry hands after use.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING. Rinse mouth with water. Never give anything by mouth to an unconscious person. Transport the person to emergency care facility.
IF INHALED: Move the person to fresh air. If not breathing, give artificial respiration. Consult a physician.
Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.
IN CASE OF SKIN CONTACT: Remove contaminated clothing and wash before reuse. Wash off with soap and plenty of water. Take the person immediately to the hospital. Consult a physician.

IN CASE OF EYE CONTACT: Flush eyes with water for at least 30 minutes while holding eyelids open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Consult a physician. Transport the person to the hospital.

Symptoms and effects (acute and delayed):
Skin: eczema, rash, burns
Eyes: reddening, burning, cornea damage, blindness
Inhalation: irritation, chest tightness, throat swelling, burns, death
allergic individuals can experience asthmatic attack at low inhalation level
Swallowing: burns, death
Cancer: possible carcinogen

Waste handling:
Formaldehyde is disposed of as chemical waste. Collect in plastic containers, label and bring to chemical waste storage on floor 2.

Risk assessment
Formamide (Sigma Aldrich F9037)

Synonyms: Methanamide, formic amide
CAS-no: 75-12-7
Appearance: Clear colorless liquid.
Storage: Cool, dry and well ventilated. Keep the container tightly closed. 2-8 °C
Molecular formula: CH_3NO
Molecular weight: 45.04

Description:
Formamide is an amide derived from formic acid. It is miscible with water and dissolves many ionic compounds.

Main use:
Formamide is used as a solvent and to stabilize RNA and single stranded DNA for gel electrophoresis.

Hazards identification:
May cause harm to unborn child
Avoid exposure
In case of accident or if you feel unwell, seek medical advice immediately

Precautionary safety measurements upon handling:
Keep away from sources of ignition.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes, or clothing. Use safety glasses, nitrile gloves and impervious clothing.
wash hands before breaks and immediately after handling the product
When extinguishing fire: use alcohol foam, dry chemical or carbon dioxide. Do NOT use halogenated extinguishing media.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING. Rinse mouth with water. Never give anything by mouth to an unconscious person. Consult a physician.
IF INHALED: Move the person to fresh air. If not breathing, give artificial respiration. Consult a physician.
Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.
IN CASE OF SKIN CONTACT: Remove contaminated clothing and wash before reuse. Wash off with soap and plenty of water. Take the person to the hospital. Consult a physician.
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes while holding eyelids open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Consult a physician

Symptoms and effects (acute and delayed):
Gastrointestinal disturbance, nausea, loss of appetite, diarrhea, liver injury, increased blood pressure, skin irritation

Waste handling:
Formamide is disposed of as chemical waste. Collect in plastic containers, label and bring to chemical waste storage on floor 2.

Risk assessment
Hydroxyurea (Sigma Aldrich H8627)

Synonyms: HU
CAS-no: 127-07-1
Appearance: white powder.
Storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Recommended storage temperature: 2-8°C. Avoid exposure to moisture.
Molecular formula: $CH_4N_2O_2$
Molecular weight: 76.05 g/mol

Description:
Anti-neoplastic. Inactivates ribonucleoside reductase by forming a free radical nitroxide that binds a tyrosyl free radical in the active site of the enzyme. This blocks the synthesis of deoxynucleotides, which inhibits DNA synthesis and induces synchronization or cell death in S-phase.

Main use:
Synchronization of cells.

Hazards identification:
May cause heritable genetic damage. Possible risk of harm to the unborn child. Suspected of damaging fertility.

May be harmful if inhaled. May cause respiratory tract irritation.
May be harmful if swallowed.
May be harmful if absorbed through skin. May cause skin irritation.
May cause eye irritation.

The chemical, physical, and toxicological properties have not been thoroughly investigated.

Precautions for safe handling
Avoid exposure.
Use personal protective equipment as required.
Handle with gloves! Wash and dry hands after use.

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes, or clothing. Use safety glasses, protective gloves and impervious clothing.

First aid measurements:
Consult a physician.
IF SWALLOWED: Never give anything by moth to an unconscious person. Consult a physician.

IF INHALED: Move the person to fresh air. If not breathing, give artificial respiration. Consult a physician.
IN CASE OF SKIN CONTACT: Wash off with soap and plenty of water. Consult a physician.
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes as a precaution. If irritation persists, consult a physician.

Symptoms and effects (acute and delayed):
The chemical, physical and toxicological properties have not been thoroughly investigated.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with afterburner and scrubber. i.e. put waste in the yellow containers!

Risk assessment
METHYL METHANESULFONATE
CAS-no: 66-27-3
Appearance: Clear colorless liquid.
Synonyms: MMS
Storage: dry and well ventilated. Keep the container tightly closed.
Molecular formula: $C_2H_6O_3S$
Molecular weight: 110
Description: Methyl methanesulfonate is an ester of sulfuric acid that exists as a colorless to amber liquid at room temperature.

Main use: Methyl methanesulfonate is used experimentally as a research chemical to induce DNA damage.

Toxic effects in human: Therapeutic application to cancer patients of total doses ranging from 2.8 to 800 mg/kg bw over a period of up to 350 days led to significant gastrointestinal and hepatic toxic effects (IARC, 1974).

Hazards identification: Methyl methanesulfonate is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals. Methyl methanesulfonate caused tumors in mice and rats at several different tissue sites and by several different routes of exposure.
No epidemiological studies were identified the relationship between human cancer and exposure specifically to methyl methanesulfonate.

First aid measurements:
If swallowed: Induce vomiting with fingers down the back of the throat, give water to drink as much as possible.
Skin contact: Immediately remove all contaminated clothing, including footwear and flush skin with running water and soap if available.
Eye contact: Wash out immediately with fresh running water

Overall evaluation from IRAC: Methyl methanesulfonate is probably carcinogenic to humans (**Group 2A**). In making the overall evaluation, the Working Group took into consideration that methyl methanesulfonate is a direct-acting methylating agent which is mutagenic in a wide range of in-vivo and in-vitro test systems.
Use virkon to neutralize activity.

More information: http://monographs.iarc.fr/ENG/Monographs/vol71/mono71-48.pdf

Risk assessment
Sodium hydroxide / NaOH, 5M (Substratenheten)

Synonyms: caustic soda, lye
CAS-no: 1310-73-2
EC-no: 215-185-5
Appearance: clear transparent liquid.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Keep away from metals. Keep away from flammable liquids. Keep away from organic halogens.
Molecular formula: NaOH
Molecular weight: 40.00

Description: Sodium hydroxide solution is a strongly basic solution.

Main use: Laboratory chemical.

Hazards identification:
Corrosive.
Causes severe eye burns.
Causes skin burns. May cause deep, penetrating ulcers of the skin.
Causes gastrointestinal tract burns. Causes severe pain, nausea, vomiting, diarrhea, and shock.
Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.
Prolonged or repeated skin contact may cause dermatitis.

Precautionary safety measurements upon handling:
Wear suitable gloves and eye/face protection.
Wash hands thoroughly after handling. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

First aid measurements:
IF SWALLOWED: Do NOT induce vomiting. Immediately consult a physician and Giftinformationscentralen. Rinse mouth by water. Remove any dental prostheses. Move the person to fresh air and into a position that eases breathing. If the person is conscious and not feeling sick, give small amounts of water to drink. Never give anything by mouth if the person is unconscious. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing.

IN CASE OF SKIN CONTACT: Remove contaminated clothing immediately. Wash off with plenty of soap and water.. Consult a physician. Clean contaminated clothing before use.

IN CASE OF EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Lift upper and lower eyelid occasionally. Remove contact any lenses. Consult a physician.

Symptoms and effects (acute and delayed):
burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Waste handling: Offer surplus powder, solutions and contaminated packaging to a licensed disposal company.

Risk assessment
Phenol:Chloroform mixtures 5:1 and 25:24:1 (with Isoamyl Alcohol) (Sigma Aldrich P1944 & P2069)

Appearance: clear liquid
Storage: 2-8°C

Description / Main use: Phenol:Chloroform mixtures used for purification of nucleic acids from organic impurities and protein.

Hazards identification:
Acute toxic if swallowed and in contact with skin.
Causes burns.
Danger of serious damage to health by prolonged exposure through inhalation, skin contact or swallowing.

Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Dermal (Category 4)
Skin corrosion (Category 1B)
Germ cell mutagenicity (Category 2)
Carcinogenicity (Category 2)
Specific target organ toxicity - repeated exposure (Category 2)

Precautionary safety measurements upon handling:
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Wear tightly fitting safety goggles and face shield.
Handle with appropriate gloves (disposable nitrile gloves).
Wear lab coat.

First aid measurements:
IF SWALLOWED: Do NOT induce vomiting. Immediately consult a physician and Giftinformationscentralen. Rinse mouth by water. Remove any dental prostheses. Move the person to fresh air and into a position that eases breathing. If the person is conscious and not feeling sick, give small amounts of water to drink. Never give anything by mouth if the person is unconscious. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing.

IF BREATHED IN: Move the person to fresh air and into a position that eases breathing. If the person is not breathing, give artificial respiration. Note that mouth-to-mouth contact can be dangerous to the person giving it. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing. Consult a physician. If decomposition product released upon fire has been inhaled the effects may be delayed.

IN CASE OF SKIN CONTACT: Take off contaminated clothing and shoes immediately. Wash immediately with plenty of soap and water.. Consult a physician. Clean contaminated clothing before use.

IN CASE OF EYE CONTACT: Flush eyes with plenty of water for at least 15. Lift upper and lower eyelid occasionally. Remove contact any lenses. Consult a physician if irritation occurs.

Symptoms and effects (acute and delayed):
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Symptoms include spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea

Waste handling: Collect excess liquid and contaminated materials in the containers marked ‘Phenol waste’ in the fume hood.

Risk assessment

Complete EDTA protease inhibitor cocktail tablets (Sigma Aldrich D5758)

Components: Polyvinylpyrrolidone (CAS-no:9003-39-8), Polyethylene glycol (CAS-no:25322-68-3, AEBSF 4-(2-Aminoethyl)-benzenesulfonyl floride hydrochloride (CAS-no:30827-99-7),D-Mannitol (Cas-no:69-65-8)

Appearance: White tablets. Colorless when dissolved in liquid.
Storage: Store dry at 2-8°C.
Molecular formula:
Molecular weight: 174.2

Description:
Mixture of several protease inhibitors in tablet form.

Main use:
Dissolved and added to solutions to inhibit proteases.

Hazards identification:
Especially the protease inhibitor AEBSF (similar to PMSF) is toxic and corrosive.

Harmful if swallowed (may cause gastrointestinal irritation)
Harmful if inhaled
Harmful/corrosive in contact with skin.
May cause damage to eyes.

Precautionary safety measurements upon handling:
Respiratory protection: Not required under normal use of this product.
Hand protection: Wear appropriate protective gloves to prevent skin contact. Replace torn or punctured gloves promptly
Skin and body protection: Wear appropriate body protection to prevent skin contact
Eye protection: Wear appropriate eye protection to prevent eye contact
Hygiene measures: Avoid contact with skin, eyes and clothing

Avoid dust formation

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING, unless instructed to do so by medical personnel. Rinse mouth with water. Never give anything by moth to an unconscious person. Consult a physician.
IF BREATHED IN: Move to fresh air. If not breathing, give artificial respiration. Consult a physician.
IN CASE OF SKIN CONTACT: Immediately flush with plenty of water for at least 15 min. Consult a physician .
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes, also under eyelids. Remove contact lenses if possible. Call a physician immediately.

Emergency phone: Giftinformationscentralen 112

Find out more: http://www.sigmaaldrich.com/

Precautionary safety measurements upon handling:
Avoid contact with skin and eyes.
Use eye/face protection, gloves and protective clothing
Wash hands after use.
Avoid dust formation.

Symptoms and effects:
Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea

Waste handling:
Slightly toxic to water life. Remaining quantities can be disposed of in waste water, taking
care to observe official threshold values

Risk assessment
Phenylmethanesulfonyl fluoride (Sigma Aldrich P7626)
CAS-no: 329-98-6
Synonyms: PMSF, α-Toluenesulfonyl fluoride, Benzylsulfonyl fluoride.

Appearance: white or slightly yellow powder.
Storage: Store in cool place. Keep container tightly closed. Sensitive to moisture
Molecular formula: C7H7FO2S
Molecular weight: 174.2

Description:
PMSF is an inhibitor of serine proteases and acetylcholinesterase. Inhibits proteases such as trypsin, chymotrypsin, thrombin and papain.

Main use:
Added to solutions to inhibit proteases

Hazards identification:
PMSF is a highly toxic inhibitor of acetylcholinesterase, acutely toxic and the powder is skin corrosive. DANGER!

Toxic if swallowed.
Harmful if inhaled .
Corrosive and causes burns in contact with skin.
Causes serious damage to eyes.

Hydrolysation and contact with metal surfaces can generate flammable/explosive hydrogen gas.

Precautionary safety measurements upon handling:
Avoid contact with skin and eyes.
Avoid breathing dust/vapors.
Use breathing protection, ensure sufficient ventilation and avoid dust formation
Use eye/face protection.
Use gloves and protective clothing.
Wash hands after use.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING, unless instructed to do so by medical personnel. Rinse mouth with water. Never give anything by moth to an unconscious person. Consult a physician, call the poison information center (Giftcentralen 112)
IF BREATHED IN: Move to fresh air. If not breathing, give artificial respiration. Consult a physician immediately.
IN CASE OF SKIN CONTACT: Remove contaminated clothing/shoes immediately and wash with soap and plenty of water for at least 15 min. Call a physician.

IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes, also under eyelids. Remove contact lenses if possible. Call a physician immediately.

Symptoms and effects:

None listed for PMSF powder. Solution (in ethanol); Central nervous system depression, narcosis, nausea, headache, vomiting, damage to heart

Waste handling:

Mix with combustible solvent and incinerate (Usually dissolved in isopropanol or ethanol).

Risk assesment **Sodium Azide**
Synonyms: Sodium salt of hydrazoic acid; Smite; Azium.
CAS-No. : 26628-22-8
Appearance: White odorless crystalline powder. Soluble.
Molecular Formula:N3Na
Molecular Weight:65.01
Circumstances of use. Sodium azide is a common preservative of samples and stock solutions in laboratories and a useful reagent in synthetic work.

Chemical Stability: Heating may cause an explosion. Contact with acid liberates gas. Heat sensitive
Conditions to Avoid: Incompatible materials, dust generation, moisture, metals, strong acids, temperatures above 250°C.
Incompatibilities with Other Materials: Acids, metals, halogenated hydrocarbons, acid chlorides.
Hazardous Decomposition Products: Nitrogen oxides, sodium oxide, hydrazoic acid.

Hazards identification:
Danger! May be fatal if inhaled, absorbed through the skin or swallowed. Reacts with many heavy metals to form explosive compounds. A danger of explosion exists from friction, heat or shock. Causes eye, skin, and respiratory tract irritation. Contact with acids liberates toxic gas. Readily absorbed through the skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target Organs: Blood, kidneys, heart, central nervous system, liver, spleen, respiratory system, eyes, skin.
Potential Health Effects
Eye: Causes eye irritation. Contact with dust or vapor may cause systemic toxic
Skin: Causes skin irritation. May be fatal if absorbed through the skin. Substance is readily absorbed through the skin.
Ingestion: May be fatal if swallowed. May cause irritation of the digestive tract. May cause low blood pressure, rapid heartbeat, skin discoloration, and possible coma.
Inhalation: May be fatal if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. The vapor of hydrazoic acid may be present where sodium azide is handled. Symptoms of acute exposure to hydrazoic acid include eye irritation, headache, dramatic decrease in blood pressure, weakness, pulmonary edema, and collapse.
Chronic: May cause liver and kidney damage. Repeated exposure may cause damage to the spleen. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Animal studies have reported the development of tumors.

First aid measures.

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water

for at least 15 minutes while removing contaminated clothing and shoes.
SPEEDY ACTION IS CRITICAL!
Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.
Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. **SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY.** Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Most important symptoms and effects, both acute and delayed: Nausea, Dizziness

Emergency phone: Giftinformationscentralen 112

Fire Fighting Measures
General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Containers may explode in the heat of a fire. Forms explosion sensitive compounds with some metals such as lead and copper. Form hydrazoic acid vapor in contact with acid or water. Hydrazoic acid vapor is highly toxic and a dangerous explosive. Hydrazoic acid is shock sensitive.
Extinguishing Media: Do NOT use water directly on fire. Use special powder against metal fire, Sand, Cement.
Handling and storage
Handling: Keep workplace dry. Do not allow product to come in contact with water.
Storage: Store in a cool, dry place. Store in a tightly closed container. Keep away from acids. Do not store in metal containers.
Precautionary safety measurements upon handling:
Respiratory Protection: Dust/mist mask. Fumehood.
Eye/face protection: Safety glasses with side-shields.
Skin Protection: Handle with gloves. Nitrile-rubber gloves(0.11 mm, break-through time>480 min).

STABILITY AND REACTIVITY
Chemical Stability: Heating may cause an explosion. Contact with acid liberates gas. Heat sensitive
Conditions to Avoid: Incompatible materials, dust generation, moisture, metals, strong acids, temperatures above 250°C.
Incompatibilities with Other Materials: Acids, metals, halogenated hydrocarbons, acid chlorides.
Hazardous Decomposition Products: Nitrogen oxides, sodium oxide, hydrazoic acid.
ACCIDENTAL RELEASE MEASURES
Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.
Spills/Leaks:

Wear a self contained breathing apparatus and appropriate personal protection. Avoid generating dusty conditions. Provide ventilation. Evacuate unnecessary personnel. Do not let this chemical enter the environment. Sodium azide and other inorganic azides (including explosive heavy metal azides) can be rendered harmless by spraying with or immersion into 0.1 N solution of ammonium nitrate in 2N perchloric acid.
Vacuum or sweep up material and place into a suitable disposal container. For cleaning up a small spill of sodium azide, do not use metal instruments. Wipe up solutions with chemical absorbent pads. Soak up with inert absorbent material and dispose of as hazardous waste. Cover solids with sand, sweep up, and place in a non-metal container. Once spill has been completely absorbed, wipe the area down at least two times using a soap and water solution. Do not flush down the drain. **Over a period of time, sodium azide may react with copper, lead, brass, or solder in plumbing systems to form an accumulation of the highly explosive compounds of lead azide and copper azide.**

Keep in suitable, closed containers for disposal.

Environmental precautions

Do not let product enter drains.

For more information

https://fscimage.fishersci.com/msds/20960.htm

Risk assessment
Thiabendazole, TBZ (Sigma Aldrich T8904)

Synonyms: Thaibendazole, TBZ, 2-(4-Thiazolyl)benzimidazole
CAS-no: 148-79-8
Appearance: light yellow powder
Storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
Molecular formula: $C_{10}H_7N_3S$
Molecular weight: 201.25 g/mol

Description:
Thiabendazole is a fungicide and aprasiticide. It inhibits anaerobic respiration at the level of mitochondrial helminth-specific enzyme. It acts as a quinol-fumarate reductase (QFR) inhibitor in *C. jejuni* and *H. pylori*, blocking quinol oxidation to quinone. Thiabendazole has also been used as a heavy metal chelating detoxification agent.

Main use:
Thiabendazole inhibits cell division by blocking mitotic spindle formation.

Hazards identification:
Very toxic to aquatic organisms, may cause log-term adverse effects in the aquatic environment. Do not let the product enter drains! Discharge into the environment must be avoided.

Potential health effects:
May be harmful if inhaled.
May be harmful if swallowed.
May be harmful if absorbed through skin.
May cause eye irritation.
The chemical, physical, and toxicological properties have not been thoroughly investigated.

Precautions for safe handling
Avoid formation of dust and aerosols.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes, or clothing. Use safety glasses, protective gloves and impervious clothing.
Wash and dry hands after use.
Respiratory protection is not required.

First aid measurements:
Consult a physician.
IF SWALLOWED: Never give anything by moth to an unconscious person. Consult a physician.

IF INHALED: Move the person to fresh air. If not breathing, give artificial respiration. Consult a physician.
IN CASE OF SKIN CONTACT: Wash off with soap and plenty of water. Consult a physician.
IN CASE OF EYE CONTACT: Flush eyes with water for at least 15 minutes as a precaution. If irritation persists, consult a physician.

Symptoms and effects (acute and delayed):
Anorexia, nauseas, vomiting, and dizziness. The chemical, physical, and toxicological properties have not been thoroughly investigated,

Waste handling:
Very toxic to aquatic organisms, may cause log-term adverse effects in the aquatic environment. Do not let the product enter drains! Discharge into the environment must be avoided.

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with afterburner and scrubber. i.e. put waste in the yellow containers!

Risk assessment
N,N,N′,N′-Tetramethylethylenediamine (TEMED) (Sigma Aldrich T9281)

Synonyms: 1,2-Bis(dimethylamino)ethane TEMED TMEDA
CAS-no: 110-18-9
Appearance: Clear colorless liquid.
Storage: Cool, dry and well ventilated. Keep the container tightly closed.
Molecular formula: C6H16N2
Molecular weight: 116,2 g/mol

Description:
Crosslinker and catalyst for making acrylamide gels.

Main use:
Crosslinker and catalyst for making acrylamide gels.

Hazards identification:
Highly flammable liquid and vapour. Harmful if swallowed. Causes severe skin burns and eye damage. Harmful if inhaled.

Precautionary safety measurements upon handling:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Wear protective gloves/ protective clothing/ eye protection/ face protection.

First aid measurements:
IF SWALLOWED: DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
IF BREATHED IN: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
IN CASE OF SKIN CONTACT: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
IN CASE OF EYE CONTACT: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.

Symptoms and effects (acute and delayed):
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema.

Waste handling:
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. THROW THE CONTENTS IN YELLOW BIOLOGICAL WASTE BOX.

Risk assessment
Tunicamycin (Sigma)

CAS-no: 11089-65-9
Appearance: white crystalline solid
Storage: 2-8°C. Protect from light and moisture. Keep container tightly closed in a dry and well-ventilated place.
Molecular weight: 840.0

Description: Antibacterial and antifungal. Blocks the formation of protein *N*-glycosidic linkages by inhibiting the transfer of *N*-acetylglucosamine 1-phosphate to dolichol monophosphate. Inhibits bacterial and eukaryote *N*-acetylglucosamine transferases and prevents formation of *N*-acetylglucosamine lipid intermediates.

Main use: Antibacterial and antifungal.

Hazards identification:
Very toxic/lethal if swallowed.

Precautionary safety measurements upon handling:
Wash hands thoroughly after handling.
Do not swallow.
Wear suitable gloves and eye/face protection.
Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.

First aid measurements:
IF SWALLOWED: Immediately consult a physician and Giftinformationscentralen. Rinse mouth by water. Remove any dental prostheses. Move the person to fresh air and into a position that eases breathing. If the person is conscious and not feeling sick, give small amounts of water to drink. Never give anything by mouth if the person is unconscious. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing.

IF BREATHED IN: Move the person to fresh air and into a position that eases breathing. If the person is not breathing, give artificial respiration. Note that mouth-to-mouth contact can be dangerous to the person giving it. If the person is unconscious put them in prone position (framstupa sidoläge) and ensure open airways. Loosen tight clothing. Consult a physician. If decomposition product released upon fire has been inhaled the effects may be delayed.

IN CASE OF SKIN CONTACT: Wash immediately with plenty of soap and water. In case of accident or if you feel unwell, seek medical advice immediately
(show the label where possible).

IN CASE OF EYE CONTACT: Flush eyes with plenty of water for at least 10 minutes as a precaution. Lift upper and lower eyelid occasionally. Remove contact any lenses. Consult a physician if irritation occurs.

Waste handling: Offer surplus powder, solutions and contaminated packaging to a licensed disposal company. Dissolve or mix with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Risk assessment
Sodium dodecyl sulphate (Sigma Aldrich L3771)

Synonyms: SDS
CAS-no: 151-21-3
Appearance:
Storage: Temperature RT.
Molecular formula: C12H25NaO4S
Molecular weight: 288.4 g/mol

Description:
SDS is an anionic detergent and wetting agent that is effective in both acid and alkaline solutions.1 SDS has a wide variety of applications, but is most often usedas a protein and lipid solubilization reagent. As a general rule for the solubilization of proteins, SDS should be used at its critical micelle concentration.2 SDS is also a powerful protein denaturant. The effects of SDS on protein conformation has been published.3,4 Comparisons between SDS and other detergents for solubilization of lipids, proteins, and its effect on enzymes activity has been published.2,5

Main use:
Used to solubilize and denature proteins for denaturing-PAGE. Most proteins bind SDS in a ratio of 1.4 g SDS per gram of protein. The charges intrinsic to the protein become insignificant compared to the overall negative charge provided by the bound SDS. The charge to mass ratio is essentially the same for each protein and will migrate in the gel based only on their size.

Hazards identification:
Flammable solid.
Harmful if swallowed.
Toxic in contact with skin.
Causes skin irritation.
Causes serious eye damage.
May cause respiratory irritation.

Precautionary safety measurements upon handling:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Avoid breathing dust.
Wear protective gloves/ eye protection/ face protection.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER or doctor/ physician if you feel unwell.

First aid measurements:
If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Symptoms and effects (acute and delayed):
Consult physician anyways.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. THROW THE CONTENTS IN YELLOW BIOLOGICAL WASTE BOX.

Risk assessment
Paraformaldehyde (Sigma Aldrich P6148)

Synonyms: Formagene, paraform, triformol, paraformic aldehyde, polyoxymethylene, flo-more
CAS-no: 30525-89-4
Appearance: white crystalline powder
Storage: storage under argon or nitrogen at 2-8°C is recommended.
Molecular formula: (CH20)n
Molecular weight: g/mol

Description:
Paraformaldehyde is tested at 10 mg/mL in 1 M NaOH, It is only slowly soluble in cold water, and most often is heated in water to depolymerize it. Paraformaldehyde is usually dissolved when the solution reaches 55-60°C.
It is advised to use a hot water bath rather than a hot plate when heating the solution "hot spots" (and thus decomposition) in the solution. If the solution remains cloudy, the addition of 1-2 drops of NaOH will cause it to clear, giving a formaldehyde solution which will be suitable for use for about two weeks if stored refrigerated. Note: Formaldehyde gas is evolved as paraformaldehyde dissolves. Some protocols suggest that paraformaldehyde should be prepared in buffered solutions such as phosphate buffer or phosphate buffered saline at approximately pH 7. Adding the solid to the prepared buffer makes it more difficult to obtain a clear solution (addition of NaOH is countered by buffering), but if the solid is added to about half the final volume of water containing the alkaline form of the buffer (e.g., disodium phosphate), a clear solution will be obtained without the need to add NaOH.

Main use:
Commercial formaldehyde solutions ("formalin") contain 10-15% methanol to prevent the formaldehyde from polymerizing in storage. For most applications, the presence of methanol does not interfere. Formaldehyde has been used in the past for disinfecting sickrooms, clothing, linen and sickroom utensils. It has been used as a fumigant and in manufacturing synthetic resins.7
As a fixative in electron microscopy, it is necessary to use a methanol-free preparation. Paraformaldehyde is then added to basic buffer or water, heated with stirring to 55-60°C until it dissolves, forming a formaldehyde solution.
For use as a cross-linking agent for proteins or for fixing cells, one protocol suggests using a 4% solution and a 10-minute incubation at room temperature. P6148 and 44,124-4 are both tested for formaldehyde equivalence by titration. 44,124-4 is additionally tested for formic acid content. Although the powder P6148 may dissolve more quickly than the prilled (beaded) 44,124-4, the resulting solutions, are equivalent..

Hazards identification:
Flammable solid.
Acute Toxicity, Inhalation
Acute Toxicity, Oral
Skin sensitization

Causes skin irritation.
Causes serious eye damage.
Carcinogenicity
Specific target organ toxicity – single exposure

Precautionary safety measurements upon handling:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wear protective gloves/ eye protection/ face protection.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER or doctor/ physician if you feel unwell.

First aid measurements:
If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Consult a physician.
In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Symptoms and effects (acute and delayed):
Consult physician anyways.
Most important symptom and effects, both acute and delayed
May cause irreversible eye damage

Waste handling:
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and not recyclable solutions to licensed disposal company. THROW THE CONTENTS IN YELLOW BIOLOGICAL WASTE BOX.

Risk assessment
Kanamycin sulfate from Streptomyces kanamyceticus
(Sigma Aldrich K1377)

Synonyms: Kanamycin A, Kanamycin sulfate salt
CAS-no: 25389-94-0
Appearance:
Storage: 2-8°C
Molecular formula: $C_{18}H_{36}N_4O_{11} \cdot H_2O_4S$
Molecular weight: 582,58 g/mol

Description:
Kanamycin sulfate is an antimicrobial agent effective against Gram-negative and Gram-positive bacteria and mycoplasma. It binds to the 70S ribosomal subunit, inhibits translocation, and elicits miscoding. Cross-resistance occurs between kanamycin and neomycin, framycetin, and paromomycin, and partial cross-resistance has been reported between kanamycin and streptomycin.1 Aminoglycosidemodifying enzymes (acetyltransferase, phosphotransferase, nucleotidyltransferase) alter the antibiotic, preventing its interaction with ribosomes.
Kanamycin sulfate can be added into agar (agar plate), and the plate should be then be sealed to prevent any evaporation of moisture from the agar. The sealed plate can be stored at 2-8 °C for about one
month. If the plate is not sealed to prevent evaporation of moisture, the kanamycin can degrade.

Main use:
Use in biotechnology applications to inhibit protein synthesis. Recommended for use in cell culture applications at 100 mg/L. Kanamycin sulfate is soluble in water (50 mg/ml), yielding a clear solution. Kanamycin sulfate is practically insoluble in alcohol, acetone, chloroform, ether, and ethyl acetate. A 1% solution in water has a pH of 6.5 to 8.5. This is in contrast to the pH of 5.5 to 7.5 for a 1% solution in water of kanamycin acid sulfate.

Hazards identification:
Reproductive toxicity
Toxic, may cause harm to the unborn child
Repeated exposure may cause allergic reactions in certain sensitive individuals

Precautionary safety measurements upon handling:
Avoid formation of dust and aerosols. Avoid exposure – obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed.

First aid measurements:
If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.
In case of eye contact
Rinse thoroughly with plenty of water as a precaution
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Symptoms and effects (acute and delayed):
Consult physician anyways.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. THROW WASTE SOLUTION IN THE DISPOSAL CONTEINER WITH WHITE OR RED CAP (acqueous solutions)

Risk assessment
Chloramphenicol (Sigma Aldrich C0378)

Synonyms: D-(−)-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-β-(4-nitrophenyl)ethyl]acetamide, D-(−)-threo-2-Dichloroacetamido-1-(4-nitrophenyl)-1,3-propanediol, D-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-4-nitrophenethyl]acetamide, Chloromycetin

CAS-no: 56-75-7
Appearance:
Storage: 2-8°C
Molecular formula: Cl2CHCONHCH(CH2OH)CH(OH)C6H4NO2
Molecular weight: 323,13 g/mol

Description:
Chloramphenicol is a synthetic antibiotic, which was first isolated from strains of Streptomyces venezuelae. It has a broad spectrum of activity against Gram-positive and Gram-negative bacteria.
Chloramphenicol inhibits bacterial protein synthesis by blocking the peptidyl transferase step (elongation inhibition). It binds to the 50S ribosomal subunit and prevents attachment of aminoacyl tRNA to the ribosome.

It inhibits mitochondrial and chloroplast protein synthesis and ribosomal formation of (p)ppGpp, thus de-repressing rRNA transcription. It exhibits irreversible toxicity to animal cells and humans at very high concentrations, which may be due to the inhibition of DNA synthesis.6 Chloramphenicol and several analogues inhibited DNA synthesis in Ehrlich Ascites cells under aerobic and anaerobic conditions in the presence and absence of glucose. It is possible that DNA synthesis is inhibited by chloramphenicol in whole cells in the presence of glucose because the antibiotic undergoes metabolism (possibly reduction) and the p-nitro group is important for this effect.7

Main use:
Used as a seletion agent for transformed cells containing chloramphenicol resistance genes. This antibiotic is often used in molecular biology applications for bacterial selection (10-20 mg/ml). The mode of resistance is inactivation of chloramphenicol (acetylation) by chloramphenicol acetyltransferase (cate gene).
Chloramphenicol, although a broad spectrum antibiotic has limited pharmaceutical application, used mainly for opthalmic (eye drops) and veterinary purposes.

Hazards identification:
Carcinogenicity
Toxic, may cause cancer

Precautionary safety measurements upon handling:
Avoid formation of dust and aerosols. Avoid exposure – obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed.

First aid measurements:
If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Consult a physician.
In case of eye contact
Rinse thoroughly with plenty of water as a precaution
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Symptoms and effects (acute and delayed):
Consult physician anyways.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. THROW WASTE SOLUTION IN THE DISPOSAL CONTEINER WITH WHITE OR RED CAP (acqueous solutions)

Risk assessment
Ampicillin

Synonyms: D-(−)-α-Aminobenzylpenicillin, Ampicillin trihydrate
CAS-no: 7177- 48- 2
Appearance:
Storage: 2-8°C
Molecular formula: C16H18N3O4SNa
Molecular weight: 371,4 g/mol

Description:

Main use:
The drug ampicillin is useful in gene-cloning strategies. When present in growth media, it selects for plasmid-bearing, drug-resistant bacterial colonies.

Hazards identification:
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause respiratory irritation.

Precautionary safety measurements upon handling:
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wear protective gloves.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician.

First aid measurements:
If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Consult a physician.
In case of eye contact
Rinse thoroughly with plenty of water as a precaution
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Symptoms and effects (acute and delayed):
Consult physician anyways.

Waste handling:
Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical

incinerator equipped with an afterburner and scrubber. THROW WASTE SOLUTION IN THE DISPOSAL CONTEINER WITH WHITE OR RED CAP (acqueous solutions)

Title: **Staining of cells with trypan blue**

Used hazardous chemicals: Trypan blue
Procedure: A 0.4% solution is usually used for staining of cells. Solution prepared in the lab or purchased. Final concentration 0.2%.
Hazards: Carcinogenic
Risks: Small if using purchased solution. Otherwise the risk is primarily when weighting up the material to make the stock solution.
Risk reducing measures: Wear lab coat, gloves and goggles when weighing up the substance and do the transferring in the hood or use purchased 0.4% solutions.

Title: **Preparation staurosporine solution for induction of apoptosis or inhibition of protein kinases**

Used hazardous chemicals: Staurosporin
Procedure: A 1 mM stock solution is prepared by injecting DMSO (or other organic solvent) directly through the membrane into the vial with a syringe. Aliquots of the stock are stored at -20ºC. Final concentration on the cells is not above 5 µM.
Hazards: Carcinogenic, mutagenic, very toxic if inhaled
Risks: Exposure to hands, eyes and lung when weighing up the substance
Risk reducing measures: Wear lab coat, gloves and goggles when weighing up the substance or prepare solution only by injection to membrane of the purchased vial. Do the transferring in the hood.

Title: **Agarose gel electrophoresis of DNA**

Used hazardous chemicals: Borate, ethidium bromide, formaldehyde
Procedure: 10xTBE (Tris/borate/EDTA, 0.89 M borate) buffer can be ordered from the substrate department at the hospital and used as a 10 times dilution. Alternatively the buffer is prepared in the lab. This buffer is used for running the gels. Ethidium bromide is used for staining the nucleic acids. Formaldehyde is sometimes used in the gel and the buffer.
Hazards: Borate (may be harmful to the unborn child), ethidium bromide (mutagenic), formaldehyde (carcinogenic)
Risks: Transfer of borate powder when weighing gives risk of exposure to skin, eyes and lungs, and handling the buffer is a risk of skin exposure. Drying samples with ethidium bromide or handling gels, particularly if there is ethidium bromide in the running buffer, give risk of skin exposure. Exposure to formaldehyde when casting and running gels (particularly high risks if the gel is warm).
Risk reducing measures: Use TAE (Tris/acetate/EDTA) instead of TBE (Tris/borate/EDTA) and use other dyes (e.g. Gel Red) instead of ethidium bromide. Order TBE solution from the hospital. Use lab coat, gloves and goggles. Work in the hood when weighing the borate or handling formaldehyde.

Title: **Agarose gel electrophoresis of RNA**

Used hazardous chemicals: Borate, ethidium bromide, formamide, formaldehyde
Procedure: Formamide is sometimes used for denaturation of samples before loading. 10xTBE (Tris/borate/EDTA, 0.89 M borate) buffer can be ordered from the substrate department at the hospital and used as a 10 times dilution. Alternatively the buffer is prepared in the lab. This buffer is used for running the gels. Ethidium bromide is used for staining the nucleic acids. Formaldehyde is sometimes used in the gel and the buffer.
Hazards: Borate (may be harmful to the unborn child), ethidium bromide (mutagenic), formamide (may be harmful to the unborn child), formaldehyde (carcinogenic)
Risks: Exposure of skin to formamide when denaturing the samples. Transfer of borate powder when weighing gives risk of exposure to skin, eyes and lungs, and handling the buffer is a risk of skin exposure. Drying samples with ethidium bromide or handling gels, particularly if there is ethidium bromide in the running buffer, give risk of skin exposure. Exposure to formaldehyde when casting and running gels (particularly high risks if the gel is warm).
Risk reducing measures: Use TAE (Tris/acetate/EDTA) instead of TBE (Tris/borate/EDTA) and use other dyes (e.g. Gel Red) instead of ethidium bromide. Order TBE solution from the hospital. Use lab coat, gloves and goggles. Work in the hood when weighing the borate, handling formamide or formaldehyde.

Title: **Chromatin immunoprecipitation (ChIP assay)**

Used hazardous chemicals: Formaldehyde or paraformaldehyde, phenylmethanesulfonyl fluoride, sodium dodecyl sulfate (SDS), Igepal CA-630, Triton X-100
Procedure: Formaldehyde or paraformaldehyde is used for cross-linking. A 4% solution of paraformaldehyde is prepared by dissolving the substance in water, adding a little of 1 M NaOH and heating to 60°C. After mixing with PBS the solution should be used fresh.
Hazards: Formaldehyde (carcinogenic, very toxic if inhaled, corrosive, skin sensitizing), paraformaldehyde (irritating, eye damaging, flammable, suspected carcinogen), phenylmethanesulfonyl fluoride (very corrosive, toxic if ingested), Sodium dodecyl sulfate (SDS) (eye damaging, toxic on skin, flammable), Igepal CA-630 (eye damaging), Triton X-100 (eye damaging, toxic to the environment).
Risks: The most dangerous exposure to the eyes. In addition inhalation of formaldehyde (and paraformaldehyde) should be avoided as well as exposure to the skin.
Risk reducing measures: Prepare solutions in the hood. Use lab coat, goggles and gloves when preparing and handling solutions.

Title: **Casting of SDS-PAGE gels**

Used hazardous chemicals: Sodium dodecylsulfate (SDS), acrylamide, dithiotreitol (DTT), TEMED (N,N,N',N'-tetrametyletylendiamin), ammonium persulsufate
Procedure: Gels are casted using acrylamide, SDS, ammonium persulfate, TEMED and a Tris buffer containing SDS.
Hazards: Sodium dodecylsulfate (SDS) (eye damaging, toxic on skin, flammable), acrylamide (mutagenic, carcinogenic, neurotoxic), dithiotreitol (DTT) (irritating to eyes), TEMED (N,N,N',N'-tetrametyletylendiamin) (flammable, very corrosive, hazardous if inhaled or ingested), ammonium persulsufate (oxidizing, sensibilizing to skin and eyes, irritating to skin).
Risks: Exposure to acrylamide, ammonium persulfate, SDS or TEMED when preparing gels.
Risk reducing measures: Buy ready-made gels. Use lab coat, gloves and goggles when preparing or working with the solutions. Prepare all solutions in the hood.

Title: **SDS-PAGE gel electrophoresis of proteins**

Used hazardous chemicals: Sodium dodecylsulfate (SDS), acrylamide, b-mercaptoethanol, dithiotreitol (DTT), TEMED (N,N,N',N'-tetrametyletylendiamin), ammonium persulsufate
Procedure: µl volumes of mercaptoethanol or DTT is added to the loading buffer for electrophoresis. The electrophoresis is run in a buffer containing SDS.
Hazards: Sodium dodecylsulfate (SDS) (eye damaging, toxic on skin, flammable), acrylamide (mutagenic, carcinogenic, neurotoxic), b-mercaptoethanol (deadly if inhaled or after exposure to skin, very toxic if ingested, causes severe eye damage, skin irritating, very toxic to the environment), dithiotreitol (DTT) (irritating to eyes), TEMED (N,N,N',N'-tetrametyletylendiamin) (flammable, very corrosive, hazardous if inhaled or ingested), ammonium persulsufate (oxidizing, sensibilizing to skin and eyes, irritating to skin).
Risks: The purchased gels could contain residual unpolymerized acrylamide and TEMED and should be handled with care. Exposure to b-mercaptoethanol could occur when preparing loading buffer or loading samples. Exposure to SDS when running samples.
Risk reducing measures: Replace b-mercaptoethanol with DTT. Use lab coat, gloves and goggles when preparing or working with the solutions. Prepare all solutions in the hood.

Risk assessment
Handling of strong solutions of hydrochloric or sulfuric acid

Nitric Acid

Safety Information

Symbol	 GHS03, GHS05
Signal word	Danger
Hazard statements	H272-H314
Precautionary statements	P220-P280-P305 + P351 + P338-P310
Personal Protective Equipment	Faceshields, full-face respirator (US), Gloves, Goggles, multi-purpose combination respirator cartridge (US), type ABEK (EN14387) respirator filter
Hazard Codes (Europe)	O,C
Risk Statements (Europe)	8-35
Safety Statements (Europe)	23-26-36-45
RIDADR	UN 2031 8/PG 2
WGK Germany	2

HAZARD

H272 May intensify fire, oxidizer
H314 Causes sever skin burns and eye damage

P220 Keep/store away from clothing/ combustible materials
P280 Wear protective gloves/protective clothing/eye protection/face protection
P305 IF IN EYES: **P351** Rinse cautiously with water for several minutes.

P338 Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER or doctor/physician.