

Project COSHH Assessment for the Synthesis and Testing of Stuff

| Location(s): (where will the activity or task take place?) | | | CGxxx and CGyyy | | Reference | Bioact_COSHH_1 |
|--|---------------|---|--|---|--|---|
| Chemical name and ID (e.g. CAS number) | Those at risk | Hazard statements (from GHS phrases and SDS; include workplace exposure limits if appropriate) | Quantities (amounts to be used & maximum container size) | Uncontrolled risk level (level of risk without control) | Required controls (include PPE required (type and specification), storage, known chemical incompatibilities, waste disposal measures, emergency measures in the event of fire or spillage) | Controlled risk level (risk remaining when controls are in place) |
| Chloroform (67-66-3) | All in CGxxx | H302, Harmful if swallowed. H315, Causes skin Irritation. H319, Causes serious eye Irritation. H331, Toxic if inhaled. H336, May cause drowsiness or dizziness. H351, Suspected of causing cancer. H361, Suspected of damaging fertility or the unborn child. H372, Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure. H402, Harmful to aquatic life. Can be absorbed through skin. TWA 2 ppm (10 mg/m ³). | Typical volumes 10–100 ml. Max. container size 2.5 l. | CAUTION | Transfer in fume hood. PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, PVA or Viton for immersion, nitrile for splash). Store in cabinet for non-flammabel solvents. Disposal in D waste in accordance with policy. Incompatible with strong oxidising agents, strong bases, magnesium, sodium/sodium oxides, lithium. On spillage, ensure adequate ventilation, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. Avoid breathing vapours. If swallowed, seek medical help; in contact with skin, wash with soap and water; in contact with eyes, rinse with copious amounts of water. Seek medical help if skin or eye irritation persists. | CARE |
| Deuteriochloroform (865-49-6) | All in Dept. | H302, Harmful if swallowed. H315, Causes skin Irritation. H319, Causes serious eye Irritation. H331, Toxic if inhaled. H336, May cause drowsiness or dizziness. H351, Suspected of causing cancer. H361, Suspected of damaging fertility or the unborn child. H372, Causes damage to organs | Typical volumes < 1 ml. Max. container size 100 ml. | CAUTION | Transfer in fume hood. PPE: lab coat; eye protection (EN 166-F); gloves(EN 374-3, nitrile for splash). Store in well ventilated area. Disposal in D waste in accordance with policy. Incompatible with strong oxidising agents, strong bases, aluminium, magnesium, sodium/sodium oxides, lithium. On spillage, ensure adequate ventilation, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. If swallowed, seek medical help; in contact | CARE |

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| | | (Liver, Kidney) through prolonged or repeated exposure. H402, Harmful to aquatic life. Can be absorbed through skin. TWA 2 ppm (10 mg/m ³). | | | with skin, wash with soap and water; in contact with eyes, rinse with copious amounts of water. Seek medical help if skin or eye irritation persists. | |
| Ethanol (64-17-5) | All in CGxxx and CGyyy | H225, Highly flammable liquid and vapour. H319, Causes serious eye irritation. Flash point: 14 °C, lower explosion limit 3.3%(V). | Typical volumes 10–100 ml. Max. container size 2.5 l. | CAUTION | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, nitrile). Store in fire-resistant cabinet. Disposal as B waste in accordance with policy. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. If swallowed, do not induce vomiting, wash mouth with water, seek medical help; in contact with skin, wash with soap and water; in contact with eyes, rinse with copious amounts of water for at least 15 min. Seek medical help if skin or eye irritation persists. Incompatible with alkali metals, oxidising agents, peroxides. On spillage, ensure adequate ventilation. remove sources of ignition, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | CARE |
| Acetone (67-64-1) | All in CGxxx | H225, Highly flammable liquid and vapour. H319, Causes serious eye irritation. H336, May cause drowsiness or dizziness. Flash point: -17 °C, lower explosion limit 2%(V). | Typical volumes 10–100 ml. Max. container size 5 l. | CAUTION | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, butyl rubber for immersion, nitrile for splash). Store in fire-resistant cabinet. Disposal as B waste in accordance with policy (dilute at least 10×, pref. 100×). Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. If swallowed, do not induce vomiting, wash mouth with water, seek medical help; in contact with skin, wash with soap and water; in contact with eyes, rinse with copious amounts of water for at least 15 min; if inhaled, move person to fresh air. Seek medical help if skin or eye irritation persists. Incompatible with bases, oxidizing agents, reducing agents; acetone reacts violently with phosphorous | CARE |

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| | | | | | oxychloride. On spillage, ensure adequate ventilation. remove sources of ignition, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | |
| Tetrahydrofuran (109-99-9) | All in CGxxx | H225, Highly flammable liquid and vapour. H302, Harmful if swallowed. H319, Causes serious eye irritation. H335, May cause respiratory irritation. H351, Suspected of causing cancer. EUH019, May form explosive peroxides. Can be absorbed through skin. TWA 50 ppm (300 mg/m ³). Derived no effect level by skin contact: 25 mg/kg. Flash point: -17 °C. Lower explosion limit: 1.8%(V). | Typical volumes < 100 ml. Max. container size 2.5 l. | CAUTION | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, butyl rubber). Store in fire-resistant cabinet. Disposal in C waste in accordance with policy. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Perform peroxide test before evaporating. If swallowed, rinse mouth with water, seek medical help if feeling unwell; in contact with eyes, rinse with copious amounts of water for several min; if inhaled, move person to fresh air. In case of fire, use dry powder or sand. Incompatible with strong oxidising agents and acids. On spillage, ensure adequate ventilation. remove sources of ignition, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | CARE |
| Diethyl ether (60-29-7) | All in CGxxx | H224, Extremely flammable liquid and vapour. H302, Harmful if swallowed. H336, May cause drowsiness or dizziness. EUH019, May form explosive peroxides. EUH066, Repeated exposure may cause skin dryness or cracking. TWA 100 ppm (308 mg/m ³). Flash point -39.99 °C. Lower explosion limit: 1.8%(V). | Typical volumes 10–100 ml. Max. container size 2.5 l. | ALERT | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, nitrile). Store in fire-resistant cabinet. Disposal in C waste in accordance with policy. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Perform peroxide test before evaporating. Avoid breathing vapours. If inhaled, move person into fresh air. If not breathing, seek medical help. If swallowed, do not induce vomiting, rinse mouth with water, seek medical help; in contact with eyes, rinse with copious amounts of water; if inhaled, move person to fresh air. In case of fire, use water spray, foam, powder or CO ₂ . Incompatible with strong oxidizing agents and acids. On spillage, ensure adequate | CARE |

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| | | | | | ventilation. remove sources of ignition, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | |
| Hexane (110-54-3) | All in CGxxx | H225, Highly flammable liquid and vapour. H304, May be fatal if swallowed and enters airways. H315, Causes skin irritation. H336, May cause drowsiness or dizziness. H361f, Suspected of damaging fertility. H373, May cause damage to organs through prolonged or repeated exposure. H411, Toxic to aquatic life with long lasting effects. TWA 20 ppm (72 mg/m ³). Flash point -25.99 °C . Lower explosive limit: 1.2%(V). | Typical volumes: ≤ 1 l. Max. container size 2.5 l. | ALERT | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, nitrile). Store in fire-resistant cabinet. Disposal in C waste in accordance with policy. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid breathing vapours. Avoid contact with skin and eyes. If inhaled, move person into fresh air. If not breathing, seek medical help. In case of skin contact, wash with soap and water. If swallowed, do not induce vomiting, seek medical help; in contact with eyes, rinse with water for at least 15 min and seek medical help; if inhaled, move person to fresh air. In case of fire, use water spray, foam, powder or CO ₂ . Incompatible with oxidising agents. On spillage, ensure adequate ventilation. remove sources of ignition, evacuate personnel to safe areas; do not allow to enter drains. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | CARE |
| Dichloromethane (75-09-2) | All in CGxxx | H315, Causes skin irritation. H319, Causes serious eye irritation. H335, May cause respiratory irritation. H336, May cause drowsiness or dizziness. H351, Suspected of causing cancer. H373, May cause damage to organs (Liver, Blood) through prolonged or repeated exposure if swallowed. H373, May cause damage to organs (central nervous system) | Typical volumes: ≤ 1 l. Max. container size 2.5 l. | CAUTION | Transfer in fume hood. PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, PVA or Viton for immersion, nitrile for splash). Store in cabinet for non-flammable solvents. Disposal in D waste in accordance with policy; incompatible with alkali metals, aluminum, strong oxidising agents, bases, amines, magnesium, strong acids and strong bases, vinyl compounds. On spillage, ensure adequate ventilation, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. If swallowed, seek medical help; in contact with skin, wash with soap and water; in | CARE |

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| | | through prolonged or repeated exposure if inhaled. Forms CO on metabolism. Can be absorbed through skin. TWA 100 ppm (350 mg/m ³). | | | contact with eyes, rinse with water for at least 15 min; if inhaled, move person to fresh air. Seek medical help if skin or eye irritation persists. | |
| Ethyl acetate (141-78-6) | All in CGxxx | H225, Highly flammable liquid and vapour. H319, Causes serious eye irritation. H336, May cause drowsiness or dizziness. EUH066, Repeated exposure may cause skin dryness or cracking. TWA 200 ppm. Flash point: -2.99 °C. Lower explosive limit: 2.2%(V). | Typical volumes: ≤ 1 l. Max. container size 2.5 l. | CAUTION | Transfer in fume hood. PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, butyl rubber). Store in fire-resistant cabinet. Disposal in C waste in accordance with policy. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid breathing vapours. If swallowed, do not induce vomiting, wash mouth with water, seek medical help; in contact with skin, wash with soap and water; in contact with eyes, rinse with copious amounts of water for at least 15 min; if inhaled, move person to fresh air. Seek medical help if skin or eye irritation persists. Incompatible with strong oxidizing agents. On spillage, ensure adequate ventilation. remove sources of ignition, evacuate personnel to safe areas. Compatible with the yellow 'Chemical' absorbent pads in the spill kit. | CARE |
| Silica (112926-00-8) | All in CGxxx | Inhaling of fine dust particles can lead to silicosis, COPD, lung cancer (HSE, INDG463). TWA: 6 mg/m ³ . Workplace Exposure Limit (WEL): 0.1 mg/m ³ respirable dust, averaged over 8 hours. | Typical weight: ≤ 500 g. Max. container size 25 kg. | ALERT | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374). Store in well ventilated area. disposal of dry waste (drying with LEV) in sealed A4 bag in accordance with policy. Avoid breathing dust (use LEV or dust mask, type P1, EN 143). Avoid dust accumulation. Do not allow to enter drains. Incompatible with strong oxidising agents. On spillage, absorb onto a damp cloth and dispose as solid waste in accordance with policy. Do not dry sweep. | CARE |
| Magnesium sulfate (7487-88-9) | User | Hygroscopic | Typical weights: ≤ 10 g. | CARE | Safe to store on bench. Disposal of dilute aqueous solutions accordance with policy; disposal of dry solid waste in sealed A4 bag in accordance with policy. Avoid | CARE |

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| | | | Max. container size 1 kg. | | breathing dust. Incompatible with strong oxidising agents. In case of spillage, safe to dry sweep. | |
| Hydrochloric acid (dilute aqueous solutions ≤ 2 M) | All in CGxxx | H290, May be corrosive to metals. H314, Causes severe skin burns and eye damage. H315, Causes skin irritation. H319, causes serious eye irritation. H335, May cause respiratory irritation. TWA 5 ppm (8 mg/m ³). | Typical volumes: < 500 ml. Max. container size 2.5 l. | CAUTION | PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-1/3, nitrile). Causes mild irritation in contact with eyes. Store in acids cabinet. Disposal of dilute aqueous solutions after neutralization in accordance with policy. Incompatible with metals. On spillage, neutralise with sodium bicarbonate. For small spills, soak up with bicarbonate and dispose as solid waste in accordance with policy. For large spills, after neutralisation wipe with a cloth or mop and rinse well. | CARE |
| Hydrochloric acid (concentrated) (7647-01-0) | All in CGxxx | H290, May be corrosive to metals. H314, Causes severe skin burns and eye damage. H319, causes serious eye irritation. H335, May cause respiratory irritation. TWA 1 ppm (2 mg/m ³). | Typical volumes: < 100 ml. Max. container size 2.5 l. | ALERT | Transfer in fume hood. PPE: lab coat; eye protection (EN 166-F); gloves (EN 374-3, nitrile). Store in acids cabinet. Disposal, after neutralisation, as A waste in accordance with policy. Avoid breathing vapours. Avoid contact with skin and eyes. Avoid inhalation. If inhaled, move person into fresh air, seek medical help. In case of skin contact, remove contaminated clothing and wash skin with soap and water. If swallowed, do not induce vomiting, rinse mouth with water, seek medical help; in contact with eyes, rinse with water for at least 15 min and seek medical help. Incompatible with bases, amines, alkali metals, metals, permanganates, e.g. potassium permanganate, fluorine, metal acetylides, hexalithium disilicide. Neutralise small spills (<100 ml) with sodium bicarbonate and dispose as solid waste in accordance with policy. For large spills (> 100 ml), inform SC-B/A team; soak up with the yellow 'Chemical' absorbents in the spill kit. | CARE |

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| LB broth (Luria; powder) | User | None known. | Typical weights: < 80 g. Max. container size 1 kg. | CARE | Safe to store on bench. Disposal of dilute aqueous solutions accordance with policy; disposal of dry solid waste in sealed A4 bag in accordance with policy. Avoid breathing dust. No known incompatibilities. On spillage, safe to dry sweep. Use dust mask (type P1, EN 143) if there is significant dust. Mop or damp wipe the area afterwards. | CARE |
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| Assessment prepared by | | Supervisor/PI acceptance | | Review Date |
|-----------------------------------|----------------|--------------------------|----------------------------------|-------------|
| Name(s): | Someone | Name: | A Supervisor | 11/7/2022 |
| Signature: | <i>Someone</i> | Signature: | <i>A Supervisor</i> | |
| Date: | 12/7/2021 | Date: | 12/7/2021 | |
| Competency Level: | 3 | Competency Level: | 1 (must be Level 1 to authorise) | |
| Assessment read and understood by | | | | |
| A Researcher, Someone | | | | |

RISK LEVEL

| | | Likelihood of Occurrence | | | |
|-----------------|---|--|--|--|---|
| | | Very Unlikely Little or no chance of occurrence | Unlikely A rare combination of factors would be required for an incident to result. | Possible Not certain to happen but an additional factor may result in an accident | Probable More likely to occur than not |
| Hazard Severity | Minor No or minor injury (first aid) | CARE | CARE | CARE | CAUTION |
| | Moderate Off-site medical treatment or DAFW* | CARE | CARE | CAUTION | ALERT |
| | Serious More than one DAFW, long-term absence | CARE | CAUTION | ALERT | STOP! |
| | Major Permanent disability or harm, fatality | CAUTION | ALERT | STOP! | STOP! |

*DAFW – Day Away From Work

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| CARE | Minor harm possible, serious harm very unlikely to occur; implement controls and ensure care is taken when performing activity. |
| CAUTION | Minor harm probable, major harm unlikely to occur; follow all control measures, increased level of competence required and ongoing self-assessment of risks identified. |
| ALERT | Moderate degree of harm probable but major harm unlikely; critically assess the risks and appropriate controls. Specific competence required and ongoing assessment of risks by individual and/or supervisor. |
| STOP! | Serious or major harm will probably occur; stop the activity and critically assess the risks, review safety aspects of activity and implement further, appropriate controls. Consider referencing HSE or other Best Practice, consider involving HSS. |

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| | GHS01 | Explosive | | GHS04 | Gases under pressure | | GHS07 | Harmful / Irritant / Skin sensitizer |
| | GHS02 | Flammable | | GHS05 | Corrosive | | GHS08 | Carcinogen / Germ cell mutagen / Reproductive toxicant |
| | GHS03 | Oxidising | | GHS06 | Acute toxic | | GHS09 | Hazardous to the aquatic environment |

PHYSICAL HAZARDS

| Hazard classes and hazard categories* | GHS labels** | | Old R/S labels | |
|---|--------------|--|------------------|---|
| Explosives • Unstable explosives • Explosives, divisions 1.1 to 1.3 Self-reactive substances, mixtures, types A, B Organic peroxides, types A, B | | H200 H201, H202, H203 H240, H241 H240, H241 | Danger | (R2, R3) Explosive |
| Explosives, division 1.4 | | H204 | Warning | No classification |
| Flammable gases, category 1 Flammable aerosols, category 1 Flammable liquids, category 1 | | H220 H222 H224 | Warning / Danger | (R12) (R12) R12 Extremely flammable |
| Flammable liquids, category 2 Flammable solids, category 1 Flammable solids, category 2 | | H225 H228 H228 | Warning / Danger | R11 (R11) (R11) Highly flammable |
| Flammable aerosols, category 2 Flammable liquids, category 3 | | H223 H226 | Warning | No symbol No classification flashpoint 55-60°C Flammable |
| Pyrophoric liquids, category 1 Pyrophoric solids, category 1 Substances, mixtures which in contact with water emit flammable gases, categories 1, 2 and category 3 | | H250 H250 H250 H251 H251 | Warning / Danger | R17 R17 (R15) (R15) (R15) Highly flammable |
| Self-reactive substances, mixtures, type B Self-reactive substances, mixtures, types C, D and types E, F Self-heating substances, mixtures, category 1 and category 2 | | H241 H242 H242 H251 H251 | Warning / Danger | R12 R12 Highly flammable |
| Organic peroxides, type B Organic peroxides, types C, D Organic peroxides, types E, F | | H241 H242 H242 | Warning | R7 R7 Oxidising |
| Oxidising gases, category 1 Oxidising liquids, categories 1, 2 and category 3 Oxidising solids, categories 1, 2 and category 3 | | H270 H271, H272 H271, H272 H271, H272 | Danger / Warning | R8 R8, R9 R8, R9 Oxidising |
| Gases under pressure • Compressed gases • Liquefied gases • Refrigerated liquefied gases • Dissolved gases | | H280 H280 H281 H280 | Warning | No classification |
| Corrosive to metals, category 1 | | H290 | Warning | No classification |

* Based on Annex I Regulation (EC) No 1272/2008 for all hazard categories with GHS pictograms
 ** Based on the transition table of Annex VII Regulation (EC) No 1272/2008
 *** Specific Target Organ Toxicity

HEALTH HAZARDS

| Hazard classes and hazard categories* | GHS labels** | | Old R/S labels | |
|---|--------------|--------------------------------------|----------------|--|
| Acute toxicity, categories 1, 2 • Oral • Dermal • Inhalation | | H300 H310 H330 | Danger | R28 R27 R26 Very toxic |
| Acute toxicity, category 3 • Oral • Dermal • Inhalation | | H301 H311 H331 | Danger | R25 R24 R23 Toxic |
| Germ cell mutagenicity, categories 1A, 1B Carcinogenicity, categories 1A, 1B Reproductive toxicity, categories 1A, 1B STOT***, single exposure, category 1 STOT***, repeated exposure, category 1 | | H340 H350 H360 H370 H372 | Danger | R46 R45, R49 R60, R61 R39 R48 Toxic |
| Respiratory sensitisation, category 1 Aspiration hazard, category 1 | | H334 H304 | Danger | R42 R65 Harmful |
| Germ cell mutagenicity, category 2 Carcinogenicity, category 2 Reproductive toxicity, category 2 STOT***, single exposure, category 2 STOT***, repeated exposure, category 2 | | H341 H351 H361 H371 H373 | Warning | R68 R40 R62, R63 R68 R48 Harmful |
| Acute toxicity, category 4 • Oral • Dermal • Inhalation | | H302 H312 H332 | Warning | R22 R21 R20 Harmful |
| Skin corrosion, categories 1A, 1B, 1C | | H314 | Danger | R34, R35 Corrosive |
| Serious eye damage, category 1 | | H318 | Danger | R41 Irritant |
| Skin irritation, category 2 Eye irritation, category 2 Skin sensitisation, category 1 STOT*** after single exposure, category 3 • Respiratory tract irritation • Narcotic effects | | H315 H319 H317 H335 H336 | Warning | R38 R36 R43 R37 R67 Irritant |

ENVIRONMENTAL HAZARDS

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| Hazardous to the aquatic environment, acute, category 1 Hazardous to the aquatic environment, chronic, category 1 | | H400 H410 | Warning | R50 R50/R53 Dangerous for the environment |
| Hazardous to the aquatic environment, chronic, category 2 | | H411 | Warning | R51/R53 Dangerous for the environment |