**Laboratory Risk Assessment**

**Part A: Procedure Details**

|  |  |
| --- | --- |
| **Title:** | |
| **Use of rotary evaporation to concentrate plant extracts dissolved in 2-butanol** | |
| **Brief summary of procedure:** *(append detailed procedures to risk assessment)* | |
| Up to 100mL of 2-butanol containing plant extract will be evaporated off using a rotary evaporator (with integrated water bath set to 62°C) until dry. See attached protocol for detailed instructions. | |
| **Location Details:** | |
| **Department:**  School of Biological Sciences | **Location Assessment applies to:**  All HSNO Exempt Labs in Department  Specific Location,  Building: McLaren Centre  Room: 101a-d (Bioactives Research Group) |

**Part B: Approval**

|  |  |  |
| --- | --- | --- |
| **Prepared by: (add additional rows if required)** | | |
| Name : Dr I M Strange | Signature: | Date: |
| **Department Laboratory Manager Approval:** | | |
| Name: John Smith | Signature: | Date: |
| **This Risk Assessment is to be reviewed by:** | | |
| **Date**: 1 / 2 / 2017 | | |

**Part C: Hazards Identification**

*Add additional rows as required*

| **Hazardous Substances/Materials** | | | | |
| --- | --- | --- | --- | --- |
| **Substance name** | **Hazard Classifications** | **Other Hazards/ Exposure limits** | **Max Conc. used** | **Max Qty used** |
| **2-Butanol** | **3.1C, 6.1E(oral), 6.3B 6.4A** | * **2-butanol may form explosive peroxides on concentration** | **100%** | **2.5 L** |
| **Plant extracts** | **Non-hazardous** |  |  |  |
|  |  |  |  |  |

| **Hazardous Equipment/Processes** | **Hazard** |
| --- | --- |
| **Rotary evaporator** | **Implosion hazards (under vacuum)**  **Hot liquid splash (water-bath)**  **Potential ignition source (electrical)** |
| **Concentration of 2-butanol** | **Potential for explosive peroxides to crystallise out during process** |

**Part D: Risks and Controls**

|  |  |
| --- | --- |
| **Risks**  *Describe what harm could arise from the hazards.* | **Controls**  *Describe what will be done to manage the risk, e.g. equipment, procedures, personal protective clothing and equipment.* |
| **Explosion could occur if peroxide crystals form during process resulting in serious projectile (glass) proinjuries.** | * Stocks of 2-butanol used for this process are to be labelled “May form explosive peroxides’ and marked with the date received. * Stocks must be tested with peroxide test strips after 1 year and then at 6-monthly intervals – if >100ppm peroxides detected the container must be discarded. * 2-Butanol shall be tested using peroxide strips prior to distillation (even if previously tested or less than 1 year old) and discarded if >100ppm peroxides detected. * Medium impact eye-protection to be worn * Flask to be wrapped with Poly-Net (Sigma) * Procedure to be carried out in fume hood with sash lowered to provide protection from projectiles |
| **Implosion of glass flask under vacuum resulting in projectile injury (potential for serious eye injury/lacerations)** | * Flask to be inspected before use – do not use if cracked, chipped or otherwise damaged. * Medium impact eye-protection to be worn * Flask to be wrapped with Poly-Net (Sigma) * Procedure to be carried out in fume hood with sash lowered to provide protection from projectiles |
| **Fire from ignition of 2-butanol vapours by electrical equipment (rotary evaporator)** | * Vapours should be contained within apparatus and re-condensed. * Any escaping vapours should be extracted by fume hood. * Rotary evaporator manufacturer data indicates that motor is non-sparking. * Water-bath temperature (62°C) well below auto-ignition temperature of Butanol (406°C) |
| **Splash with 2-butanol resulting in eye irritation** | * User to wear safety glasses, disposable gloves and laboratory coat. |
| **Inhalation of 2-butanol vapours resulting in drowsiness/dizziness** | * Vapours should be contained within apparatus and re-condensed. * Any escaping vapours should be extracted by fume hood. |

**Part E: Additional Controls**

*Specify any other additional generic controls that apply to this procedure*

|  |
| --- |
| **Working in Isolation Controls** |
| *Is the procedure subject to any restrictions on working in isolation? E.g. task may only be conducted between specified hours/Mon-Fri/ or more than one person must be present.*  No Yes, specify below:   * Procedure may only be carried out Monday-Friday, 8:30am – 5pm (not including stat holidays or official shut-down period over Christmas). |

|  |
| --- |
| **Hazardous Waste Disposal** |
| *Is the procedure expected to generate hazardous wastes?*  No Yes, specify disposal method:   1. Re-condensed 2-butanol waste – recycle into container labelled “used 2-butanol from rotovap”. 2. Containers where >100ppm peroxides detected –clearly mark container as “Contains Explosive Peroxides – DO NOT USE”, verbally inform other users and contact DLM to arrange disposal. |

|  |
| --- |
| **Emergency Procedures** |
| *Does the procedure require any specific emergency procedures not covered by University of Otago Emergency Procedures?*  No Yes, specifiy below: |

|  |
| --- |
| **Other:** |
| * Before commencing procedure – check that no other chemicals or equipment have been left in hood by previous user. If chemicals/equipment have been left in hood – these must be removed before commencing the procedure. |

**Part F: Training**

|  |  |  |
| --- | --- | --- |
| **Approved Trainers – Specify personnel approved to train users in this procedure:** | | |
| **Name** | **Position** | **Laboratory** |
| Dr I M Strange | Principal Investigator | Bioactives Research Unit |
| Ken Donaldsan | Technician | Bioactives Research Unit |
|  |  |  |

| **Training Record – Record trained users below** | | | | |
| --- | --- | --- | --- | --- |
| **Trainee Name** | **Signature** | **Trainer Name** | **Trainer Signature** | **Date** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |