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| **Do(1) In case of Emergency:** | | | | | | | | | | | | | | | **(2) Fire Fighting medium** | | | | | **Dry Powder (Blue)** | | | | | | |
| **The following services are being used:** | | | | | | **Electricity** | | **Water** | | | **Gases: (specify)** | | | | **Other:** | | | | | | | | | | | |
|  | |  | | | Click here to enter text. | | | | Not water | | | | | | | | | | | |
| **Action in case of Fire:** | | | | Suitable extinguishing media: Dry powder Dry sand  Unsuitable extinguishing media: Do NOT use water jet.  Special hazards: Hydrogen chloride gas, Aluminium chloride  Advice for firefighters: Wear self-contained breathing apparatus for firefighting if necessary | | | | | | | | | | | **Spillage or release measures:** | | | | Contact chemical spills team as necessary. DO NOT flush with water.  Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Collect safely and arrange disposal. Keep in suitable, closed containers for disposal. | | | | | | | |
| **First aid requirements**: | | | | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Avoid rinsing skin/eyes with water.  IF IN EYES: Rinse cautiously with eye wash for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a First Aider/ 999 and attend/call an accident emergency department. Call a local first aider for assistance.  IF INHALED:: Move person into fresh air. If not breathing, give artificial respiration. Call 999 to raise an ambulance and inform a first aider and Security on ext 9966.  Have Diphoterine spray and eyewash available locally and use for treatment. | | | | | | | | | | | | | | | | | | | | | | |
| **This is a chemical risk assessment only and other assessments may be required. All associated assessment forms must be displayed close to the procedure.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(3) Risk Assessment Number/Code:** | | | Create your own identifiable RA ref number | | | | | | | | | **(4) Name and status of researcher e.g. Phd.**. | | | | The assessor of the CRA | | | | | | **(5) Emergency contact details:** | | | Assessor or supervisors tel number | |
| **(6) Assessment Date:** | Submission date | | | | | **(7) Review/Expiry Date:** | | | (6) + 1yr max | | | **(8) Building and office Number:** | | Of assessor | | **(9) Lab Number:** | | A123 | | | | **(10) People Affected:** | | | Other fume cupboard users | |
| **(11) Title of procedure:** | **Producing an aqueous aluminium chloride solution from solid AlCl3.** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(12) Details of procedure and where applicable reaction scheme** (Including starting materials, products/by-products and pressure): | | | | | | | | | | | | | | | | | | | | | **(14) Associated Assessments and Ref** | | | | | |
| **AlCl3+3H2O⟶Al(OH)3+3HCl**  **Room temperature and pressure.**  **Inform fume cupboard users of risks of experiment and fix notice on outside of fume cupboard.**  **Wear specified PPE: Lab coat, nitrile gloves (EN374, 0.2mm as a minimum), eye protection (safety glasses), face protection (face visor) when handling solid AlCl3 outside fume cupboard when weighing out.**  **Weigh out small quantities (maximum 1g) of AlCl3 into a sealable screw top tube (e.g. Universal 30 ml tube or Duran). Avoid dust/aerosol generation caused by agitating or dropping solid and screw on lid once weighed out. Ensure tube is >10 fold higher volume than liquid to be added. Clearly label, move to fume cupboard.**  **In fume cupboard, leave clearly labelled AlCl3 solid overnight with a loose lid to absorb water from the atmosphere, store within stand to prevent spillage. The following day, add water gradually to the AlCl3 solid, corrosive HCl vapour is produced. Reaction should complete rapidly (visually obvious) but leave in fume cupboard for >30 minutes to ensure reaction completion where solid will be completely dissolved. Remove from stand, store in clearly labelled screw cap tube.**  **Resultant solution may be corrosive. Continue to handle with specified PPE.** | | | | | | | | | | | | | | | | | | | | | General risk assessment for experiment | | |  | | |
| Equip/Exp overnight running | | |  | | |
| General lab activities | | |  | | |
| Ionizing radiation | | |  | | |
| Non-Ionizing radiation | | |  | | |
| Laser Safety | | |  | | |
| Biological/Bio-COSHH | | |  | | |
| Radiological | | |  | | |
| **(13) Duration, Frequency and Temperature Range:** | | | | | | | | | | | | | | | | | | | | | RA/P&M Sheets/SOP/Other (include ref): | | | | | |
| Duration: 1 hours. Frequency: 1-2 times per year. Room temperature. | | | | | | | | | | | | | | | | | | | | | Click here to enter text. | | | | | |
| **(15) Substances used and produced** | | **(16) Quantity used and handled** | | | **(17) Duration of potential exposure** | | **(18) Hazard Symbols** | | | **(19) Physical and health hazard statements Highlight primary hazard** | | | | | **(20) Workplace Exposure Limits** | | **(21) Control Measures** | | | | | | **(22) Disposal Route** | | | **(23) Extremely or Highly Flammable?** |
| 1. AlCl3 anhydrous solid. Cas-No: 7446-70-0 | | <1 g used,  100 g stored | | | 5 minutes weighing out, 30+ minutes in fume hood | | Click Here  Click HereClick Here | | | Skin corrosion (Sub-category 1B), H314 Serious eye damage (Category 1), H318  EUH014 Reacts violently with water | | | | | 2 mg/m3 | | Fume Cupboard for duration of reaction  Lab Coat (Howie)  Safety Glasses (BS EN 166),  Gloves (BS EN 374)- Material: Nitrile rubber, Minimum layer thickness: 0.11 mm  Break through time: 480 min | | | | | | Local disposal hazardous waste procedures. O | | |  |
| 2. HCl gas produced | | Removed by fume cupboard extraction | | | 30 minutes | | Click HereClick Here | | | Corrosive to metals, Category 1, H290  Skin corrosion, Category 1B, H314  Specific target organ toxicity - single exposure, Category 3, Respiratory system, H335 | | | | | Short Term Exposure Limit (STEL):  5 ppm, 8 mg/m³  Time Weighted Average (TWA): 1 ppm 2 mg/m³ | | Lab Coat (Howie)  Safety Glasses (BS EN 166),  Gloves (BS EN 374)- Material: Nitrile rubber, Minimum layer thickness: 0.11 mm  Break through time: 480 min | | | | | | Vapour removed by fume cupboard extraction | | |  |
| 3. **Al(OH)3 hydrate produced** | | <10 ml liquid | | | 30 min in fume hood | | Click HereClick Here  Click HereClick Here | | | Non-hazardous substance | | | | | N/A | | Lab Coat (Howie)  Safety Glasses (BS EN 166),  Gloves (BS EN 374)- Material: Nitrile rubber, Minimum layer thickness: 0.11 mm  Break through time: 480 min | | | | | | Local disposal hazardous waste procedures. | | |  |
| 4. Click here to enter text. | | Click here to enter text. | | | Click here to enter text. | | Click HereClick Here  Click HereClick Here | | | Click here to enter text. | | | | | Click here to enter text. | | Click here to enter text. | | | | | | Click here to enter text. | | |  |
| **(24) Operation is (mark as appropriate): Open**  **Closed**  **Pressurised**  **Pressure relief system**  **other**  Please specify here. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(25) Are you carrying out an activity/chemical reaction that is at risk of a thermal runaway or explosion? Yes**  **If yes, what additional controls are required? Potentially explosive if large quantities are used, limit the quantity used to 1 g or less and control reaction by slow addition of water in fume cupboard** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(26) Will the activity involve handling or storage of pyrophoric or unstable substances such as peroxide? No**  **If yes, what additional controls are required?** Click here to enter text. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(27) Will flammable vapours, solid particles, fibrous particles etc. capable of forming an explosive atmosphere be present?**   **No**  **If yes, what additional controls are required?** Click here to enter text. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(28) Can less hazardous substances be used? Yes, use hexahydrate (AlCl3.6H2O) in place of anhydrous reactant, as this form does not react violently with water.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(29) Procedure for checking effectiveness of control measures**  **Ensure fume cupboard is checked prior to use (air flow indicator) and the check recorded on the local log sheet.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(30) If Carcinogens, mutagens or reproductive toxins (CMR), skin sensitisers, respiratory sensitisers, occupational asthmagens or nanoparticles are listed, is the fitness to work certificate for each individual still valid? No** | | | | | | | | | | | | | **(31) If any of the Substances above are highly flammable and extremely flammable, What control measures are in place? N/A** | | | | | | | | | | | | | |
| **(32) Is lone working permitted for this procedure? No**  **If yes, what additional controls for lone working are required?**  Click here to enter text. | | | | | | | | | | | | | **(33) Is out of hours working permitted for this procedure? Yes**  **If yes, what additional controls for out of hours working are required?**  **Other person in the lab to act as buddy aware of risk assessment.** | | | | | | | | | | | | | |
| **(34) Additional control measures or relevant information. Procedure is less hazardous if AlCl3.6H2O is used in place of anhydrous AlCl3.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(35) Risk rating of the experiment:** Medium | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Signatories**  We have discussed this chemical risk assessment and understand the hazards and the associated control measures required. A copy of this form must be displayed close to the reaction. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **(36)** **Signature of Assessor:** ……………………………………………………………………  **(37) Signature of Approver:**  ………………………………………………………………………  **(38) Signature of Verifier:**  ………………………………………………………………………  **(where necessary)** | | | | | | | | | | | | **Print Name:**  …………………………………………………………………………………  **Print Name:**  …………………………………………………………………………………  **Print Name:**  ………………………………………………………………………………… | | | | | | | | **Date:**  ……………………………………………………………  **Date:**  ……………………………………………………………  **Date:**  …………………………………………………………… | | | | | | |

