**RISK ASSESSMENT SCHOOL:**

|  |
| --- |
| **EXPERIMENT 3.3: Reactivity of metals** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 74–75 and 195

**Equipment required**

|  |
| --- |
| Each group requires:  100ml approximately of 2M Hydrochloric acid, 5 test tubes and test tube rack, a 0.5cm piece of the metals aluminium, copper, iron, magnesium and zinc. Small ball of steel wool, ruler, timer and dishwashing detergent. |

**Hazardous chemicals required/produced**

| Reactant or product name and concentration | GHS classification | GHS hazard statement | Control measures |
| --- | --- | --- | --- |
| 2M Hydrochloric acid | **WARNING**  https://jr.chemwatch.net/Resources/Images/GHSHar.GIF  https://jr.chemwatch.net/Resources/Images/GHSCor.GIF  Corrosive | H290 - May be corrosive to metals  H330 - Fatal if inhaled  H314 - Causes severe skin burns and eye damage  H335 - May cause respiratory irritation | Wear safety glasses, lab coat, gloves and closed in shoes when handling.  **Diluted acid** may cause burns and eye damage. Avoid inhalation of vapours. Use in a well ventilated room.  IF ON SKIN: Rinse skin with water/shower  IF IN EYES: Rinse eyes carefully with water for several minutes. Remove contact lenses if able to without causing distress. Continue rinsing.  IF INHALED: remove person to fresh air keep at rest in a position comfortable for breathing.  If SWALLOWED: Rinse mouth. Do not induce vomiting.  Seek medical attention if required. |
| Magnesium  (solid) | **DANGER**  https://jr.chemwatch.net/Resources/Images/GHSFla.GIF  Flammable | H228 – Flammable solid  H261 – In contact with water releases flammable gas | Keep magnesium away from open flames, hot surfaces, heat and sparks.  Wear lab coat, safety glasses and gloves when handling magnesium ribbon.  IF IN EYES: Rinse eyes carefully with fresh running water. Do not attempt to remove magnesium if it is embedded in the eye or contact lenses. Seek medical attention.  IF ON SKIN: wash with soapy water. Seek medical attention immediately if any irritation persists.  Avoid breathing any vapours produced from reactions. Do experiment in a well ventilated room.  Dispose of in accordance with local regulations. Suggest collecting magnesium pieces that have been rinsed with water and dried, and putting in a labelled small container for waste collection. |
| Zinc foil  (solid) | **WARNING**  **C:\Users\temp\Dropbox\GHSEnv[1].gif**  Environmentally damaging | **H410** – Very toxic to aquatic life with long lasting effects | Dispose of in accordance with local regulations. Suggest collecting zinc pieces that have been rinsed with water and dried, and putting in a labelled small container for waste collection. |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
| Iron  Sheet/foil/nail |  | Not classified as hazardous | Dispose of in accordance with local regulations. Suggest collecting iron pieces that have been rinsed with water and dried, and putting in a labelled small container for waste collection. |
| Aluminium  sheet /foil |  | Not classified as hazardous | Dispose of in accordance with local regulations. Suggest collecting aluminium pieces that have been rinsed with water and dried, and putting in a labelled small container for waste collection. |
| Copper  sheet/foil | |  |  |  |  | | --- | --- | --- | --- | |  | |  | | |  |  | | | |  |  | | --- | --- | | **H402** | Harmful to aquatic life |   **P273**  Avoid release to the environment. | Dispose of in accordance with local regulations. Suggest collecting copper pieces that have been rinsed with water and dried, and putting in a labelled small container for waste collection. |

Other hazards and possible risks

|  |
| --- |
| Iron nails may be used instead of foil or sheet. They have a sharp end which may pierce or graze skin.  Test tubes may break and cause cuts. Sweep up broken glass with a brush and dustpan, do not use fingers.  Discard any chipped or cracked test tubes to a broken glass bucket. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes | Yes | Yes |  | Closed in shoes  Hair tied back |
|  | | | | |

Student clean up and disposal of wastes

|  |
| --- |
| Test tubes containing the acid, metals and detergent can be put through a plastic sieve into a labelled beaker and the 2M hydrochloric acid mix and metals disposed of by the lab tech.  Collect all equipment to one place for the lab tech. |

**Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

|  |  |  |
| --- | --- | --- |
| **Teacher’s name** | **Teacher’s signature** | **Date** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |
| --- |
| \*\*\*\*NOTES:   * Individual schools have a legal obligation to acquire their own manufacturer’s SDS and produce a risk assessment relevant to their own situation. * This risk assessment sheet is provided for your guidance only. * Disposal of waste is subject to the laws and regulations of states, territories and local authorities. * It is not to be assumed that products bought from supermarkets are non-hazardous.   DISCLAIMER:  These guidelines are designed to serve as a general reference only. It does not replace the school’s legal obligation to provide a valid risk assessment to ensure the safety of the staff and students conducting this experiment. While the Publisher has endeavoured to ensure that the material provided is free from error, the Publisher does not warrant the accuracy, adequacy or completeness of that material or that the material is suitable for your intended use. To the fullest extent permitted by law the Publisher disclaims all responsibility for any actions taken or not taken in relation to the material provided. |

**RISK ASSESSMENT SCHOOL:**

|  |
| --- |
| **experiment 3.5: Conductivity of ionic compounds** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 78–79 and 197

**Equipment required**

|  |
| --- |
| Each group requires: 1 spatula of large sodium chloride crystals, 1 spatula of coarse sea salt crystals, small petri dish, 4V battery or other 4V DC power source, ammeter, wires with alligator clips, 2 graphite electrodes (rods),  3 x 100ml beakers, large spatula, glass stirring rod, paper towel |

**Hazardous chemicals required/produced**

| Reactant or product name and concentration | GHS classification | GHS hazard statement | Control measures |
| --- | --- | --- | --- |
| Salt | **WARNING**  C:\Users\temp\Dropbox\GHSHar[1].gif  Irritant | H315 – Causes skin irritation  H319 – Causes serious eye irritation.  H350 – May cause respiratory irritation | Wear gloves.  IF ON SKIN: Wash hands with soap and water.  Wear safety glasses.  IF IN EYES: Flush immediately with fresh running water for several minutes. If irritation continues seek medical advice.  Avoid breathing dust. Use in a well ventilated area. |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
| Graphite rods |  |  |  |

Other hazards and possible risks

|  |
| --- |
| Broken glass – Glass beakers, glass petri dishes and glass stirring rods may break and cause cuts. Sweep up broken glass with a brush and dustpan, do not use fingers. Discard to a broken glass bucket.  A battery can release heat while connected via a short circuit. This may lead to a rupturing of the battery case. The contents of the battery are corrosive. Batteries if no longer charged should be collected and stored for waste removal. Do not put in the rubbish bin.  If power boxes are used, they are plugged into mains power. Follow safety precautions for using electricity, particularly around liquids. Ensure electrical equipment has current tag, safe and operated correctly. Check cords regularly and replace if any signs of damage. Let lab technician know if any faults found. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes | Yes | Yes |  |  |
|  | | | | |

Student clean up, disposal of waste and practical hints.

|  |
| --- |
| Salt solution can be collected for the lab tech so they can evaporate to make more large crystals for the future or disposed of by flushing down the sink, followed by water.  Rinse disconnected electrodes under running water and dry with a paper towel.  Collect all equipment to one place for the lab tech.  Unplug power boxes and ensure cords are wrapped carefully around the power boxes.  Ensure wires are left tidy and untangled.  Note: Ask your lab technician to prepare large salt crystals a couple of weeks prior to the class experiment.  Add a globe to your circuit prior to testing your crystals to check everything is working. It is safer on the ammeter to use a globe for testing the circuit rather than touching the ends of the electrodes together. |

**Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

|  |  |  |
| --- | --- | --- |
| **Teacher’s name** | **Teacher’s signature** | **Date** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |
| --- |
| \*\*\*\*NOTES:   * Individual schools have a legal obligation to acquire their own manufacturer’s SDS and produce a risk assessment relevant to their own situation. * This risk assessment sheet is provided for your guidance only. * Disposal of waste is subject to the laws and regulations of states, territories and local authorities. * It is not to be assumed that products bought from supermarkets are non-hazardous.   DISCLAIMER:  These guidelines are designed to serve as a general reference only. It does not replace the school’s legal obligation to provide a valid risk assessment to ensure the safety of the staff and students conducting this experiment. While the Publisher has endeavoured to ensure that the material provided is free from error, the Publisher does not warrant the accuracy, adequacy or completeness of that material or that the material is suitable for your intended use. To the fullest extent permitted by law the Publisher disclaims all responsibility for any actions taken or not taken in relation to the material provided. |

**RISK ASSESSMENT SCHOOL:**

|  |
| --- |
| **CHALLENGE 3.7: Modelling alloys** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 82–83 and 199

**Equipment required**

|  |
| --- |
| Each group requires:  4 different colours of plasticine, sand (12g), newspaper, electronic balance, magnifying glass |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |
| --- | --- | --- |
| Plasticine |  | Plasticine not classified as hazardous |
| Sand |  | Ensure clean from a supplier. Avoid getting in eyes, will irritate. |

Other hazards and possible risks

|  |
| --- |
| Electronic balances are plugged into mains electricity. There is the possibility of an electric shock. Ensure electrical equipment has current tag, safe and operated correctly. Check cords regularly and replace if any signs of damage. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |

Student clean up and disposal of wastes

|  |
| --- |
| Teachers note: Supervise the use of the electronic balances. They are delicate instruments and the students may need direction on how to tare an object and place it gently on the pan.  Playdough can be used instead of plasticine. As sand is rolled into the plasticine/playdough it will need to be discarded after the experiment. Perhaps suggest the groups are bigger so as to limit waste. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

|  |  |  |
| --- | --- | --- |
| **Teacher’s name** | **Teacher’s signature** | **Date** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |
| --- |
| \*\*\*\*NOTES:   * Individual schools have a legal obligation to acquire their own manufacturer’s SDS and produce a risk assessment relevant to their own situation. * This risk assessment sheet is provided for your guidance only. * Disposal of waste is subject to the laws and regulations of states, territories and local authorities. * It is not to be assumed that products bought from supermarkets are non-hazardous.   DISCLAIMER:  These guidelines are designed to serve as a general reference only. It does not replace the school’s legal obligation to provide a valid risk assessment to ensure the safety of the staff and students conducting this experiment. While the Publisher has endeavoured to ensure that the material provided is free from error, the Publisher does not warrant the accuracy, adequacy or completeness of that material or that the material is suitable for your intended use. To the fullest extent permitted by law the Publisher disclaims all responsibility for any actions taken or not taken in relation to the material provided. |