# SSERC logo

**SSERC Risk Assessment** (revised version March 2018)

(based on HSE’s INDG 163 ‘Risk assessment - A brief guide to controlling risks in the workplace’)

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| Activity assessed | Ocean Acidification |
| *Date of assessment* | 30th June 2020 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | | | |
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| *List Significant hazards here:* | *Who might be harmed and how?* | *What are you already doing?*  *What further action is needed?* | *Actions* | | | | |
| *by whom?* | | *Due date* | | *Done* |
| **Dry Ice Demonstration** |  |  |  |  | |  | |
| Solid carbon dioxide can cause frostbite and the release of asphyxiating gas | Technician and teacher by inhalation and skin contact | Remove any metal jewellery  Wear leather gloves and indirect vent goggles (BS 166 3) |  |  | |  | |
| **Preparation of bicarbonate indicator** |  |  |  |  | |  | |
| Cresol red & Thymol blue have no significant hazards |  | Avoid breathing in any dust |  |  | |  | |
| Ethanol is highly flammable and harmful if swallowed | Technician and teacher by fire | Keep well away from sources of ignition |  |  | |  | |
| Sodium hydrogen carbonate and the Bicarbonate indicator have no significant hazard |  |  |  |  | |  | |
| **Solubility of carbon dioxide** |  |  |  |  | |  | |
| 0.1M sodium hydroxide is irritant | Technician, teacher and pupil by splashes | Wear eye protection |  |  | |  | |
| Phenolphthalein is a carcinogen (cat 2). The solution is highly flammable and irritant (properties of the solvent) | Technician while preparing solution by inhalation.  Teacher and pupils by fire | Avoid breathing in any dust  Keep well away from sources of ignition.  The very small quantities (drops) do not merit the use of eye protection. |  |  | |  | |
| **Resisting the acidification** |  |  |  |  | |  | |
| Seawater, vinegar and phenol red have no significant hazard |  |  |  |  | |  | |
| Ethanol is highly flammable and harmful if swallowed | Technician and teacher by fire | Keep well away from sources of ignition |  |  | |  | |
| 0.4M sodium hydroxide is irritant | Technician, teacher and pupil by splashes | Wear eye protection. |  |  | |  | |
| **Are plants the answer?** |  |  |  |  | |  | |
| Bicarbonate indicator has no significant hazard |  |  |  |  | |  | |

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| **Description of activity:**  Using combustion of a party candle to show how carbon dioxide lowers the pH of water. This can be seen by the colour change of the bicarbonate indicator solution.  Using a breathing system to show the relationship between temperature and solubility of carbon dioxide. This can be done by counting the number of times exhaled through a dilute solution of sodium hydroxide and phenolphthalein indicator.  Determining which type of water has the best buffering action to carbon dioxide being dissolved in water. This can be done by breathing through the types of waters and counting the number of drops of dilute solution of sodium hydroxide is needed to bring the pH back to where it started from using a phenol red indicator.  Using the plant Cabomba to show how photosynthesis can help to reduce the effects of ocean acidification. This can be seen by placing the Cabomba into the acidified water and bicarbonate indicator and then leaving it to photosynthesise. |
| **Additional comments:**  When carrying out the dry ice demonstration it is good practice to follow the guidelines given for the device being used. You must wear the required PPE (leather gloves). Carry out in a well ventilated lab to avoid any build up of gas.  For the ocean acidification practical students must be made aware of the risks of burns when placing the candle into the beaker and to use tongs to lift the watch glass.  For the solubility of carbon dioxide although the breathing system has traps to avoid any suck back, students must be made aware to breathe carefully and at a steady rate. If suck back occurs rinse mouths thoroughly with copious quantities of water.  Resisting the acidification it is sensible to to use synthetic seawater to remove any risks of contaminated seawater samples – alternatively boil it first to kill off any microbes.  For plants are the answer students must be made aware of the risk of burns from the lamps being used. |