|  |  |  |
| --- | --- | --- |
| **Foundation Year** | **Standard Solutions** | **Semester 1** |

**Standard Solutions**

**Aim**

To make up a standard solution of sodium carbonate.

**Introduction**

A standard solution is one whose concentration is known exactly. Some standard solutions, for example of acids, are easy to prepare and are usually supplied. Standard solutions of solids can be prepared by weighing a mass of solid, and dissolving it in a known volume of solution in a volumetric flask. You are going to prepare a standard solution of sodium carbonate to use in another practical. You will exchange your standard solution with a partner group who will carry out a titration to work out the concentration, while you do the same with their standard solution. More guidance on making up standard solutions, if required, can be found within some excellent videos online:

Making a Standard Solution: <http://rsc.org/learn-chemistry/resource/res00002257/standard-solution>

**Skills associated with this practical**

|  |  |
| --- | --- |
| **Practical Skills**   * Correct use of a top pan balance * Making up a standard solution | **Scientific Skills**   * Performing mole calculations |

**Signposts**

‘Chemistry’, Conoley and Hills sections 6.5 and 6.6 (pp. 130 – 133).

**Understanding Hazard and Minimising Risk**

You must stand up throughout the practical, and safety glasses must be worn at ALL times in the lab. You must wear a labcoat whilst you are carrying out ALL practical work. Long hair must be tied back, and trousers (jeans are OK) must be worn. Open-toed shoes and clothing revealing bare skin are not permitted.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Substance | Amount | Hazards | Minimising Hazards | Disposal / Spillage |
| Sodium carbonate | 1.2-1.4 g | May be harmful if inhaled. May cause respiratory tract irritation. May be harmful if swallowed.  May be harmful if absorbed through skin. May cause skin irritation. Causes serious eye irritation. | Avoid contact with skin (gloves may be worn), | Pour down sink with lots of water. |

**Procedure**

Apparatus

PER PAIR: Spatula 100 cm3 beaker

De-ionised water 250 cm3 volumetric flask

Filter funnel Teat pipette

Weighing boat Label

Anhydrous sodium carbonate

Method

1. Using a top-pan balance, weigh accurately between 1.2 g and 1.4 g of sodium carbonate into a weighing boat. Record the mass in your lab notebook.

2. Transfer the contents of the weighing boat into the small beaker.

3. Rinse any remaining residues from the weighing boat into the 100 cm3 beaker using a few cm3 of distilled water. Repeat this several times and swirl the beaker to mix the contents.

5. Transfer the solution from the beaker into the volumetric flask using the funnel. Rinse the beaker and funnel several times using a few cm3 of distilled water each time.

6. Make the standard solution up to the mark on the volumetric flask with de-ionised water. Take a photo of the apparatus showing that it has been filled to the correct level for your *Skills Portfolio*.

7. Stopper firmly, and shake the flask thoroughly to mix the contents.

8. Label the flask clearly with your name, the date, and the contents of the flask.

**Analysis and questions – you will be required to enter some of your answers into Labdog**

Work out the concentration of your standard solution of sodium carbonate (Na2CO3). Keep a record of this and submit it to Labdog, **but do not share it with your partner group until they have completed the titration at the end of the session.**

**Deadlines, Assessment and Feedback on Performance**

You are required to complete the Skills Portfolio document associated with this practical (both parts a and b). This should be completed electronically with all photos inserted in the appropriate places and accompanying text typed in. The submission deadline for *Skills Portfolios* will normally be midnight on the Sunday following the practical, although you will be given specific guidance during the practical session. Submission is via the e-submission system Turnitin which you will be able to access in the appropriate folder in the Laboratories and Coursework Blackboard course.