**The hunt for vitamin C**

This resource accompanies the article **Vital vitamins** in *Education in Chemistry* which can be viewed at [rsc.li/46meZdM](https://rsc.li/46meZdM).

The resource has been adapted from the book series **In search of more solutions.** You can find more practical problem-solving activities from this series at: [rsc.li/3Q5bsKR](https://rsc.li/3Q5bsKR).

**Introduction**

Read our standard health and safety guidance ([rsc.li/3IAmFA0](https://rsc.li/3IAmFA0)) and carry out a risk assessment before running any live practical. See the **teacher notes** for further instructions and the **student sheets** for partial instructions to carry out the problem-solving experiment.

**Available equipment**

* Filter funnel
* Muslin or glass wool
* 25 cm3 pipette and safety filler
* 50 cm3 burette
* 250 cm3 conical flask
* 25 cm3 measuring cylinder
* 100 cm3 measuring cylinder
* 500 cm3 measuring cylinder
* 250 cm3 beaker
* Bunsen burner, tripod and gauze
* Safety glasses
* Liquidiser
* Safety equipment: safety glasses

**Preparation and safety**

* 100 g of green cabbage

(With a large class provide students with pre-shredded cabbage and allow them to weigh out 100 g).

* Deionised water to ensure no dissolved oxygen interferes with the vitamin C content.

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| **Chemicals supplied for the practical** | **Preparation** |
| Phosphoric acid solution, 5% solution, equivalent to about 0.9 mol dm-3.  H3PO4(aq)  Currently not classified as hazardous.  CLEAPSS hazcard HC072. | Phosphoric acid concentrated solution.  H3PO4(l)  The usual concentrated commercial solution is about 85% (w/w) which is equivalent to 14.7 mol dm‒3. Check information from supplier.  MW = 97.99 g mol-1  Irritant hazard symbol  DANGER  Causes severe burns and eye damage.  Wear splash-proof goggles and chemical-resistant gloves.  CLEAPSS recipe book RB065. |
| 2, 6-Dichlorophenolindophenol (DCPIP) solution, 0.4 g dm-3.  C12H7NCl2O2(aq)  Not usually considered as hazardous. Check the supplier’s SDS.  CLEAPSS hazcard HC032. | 2, 6-Dichlorophenolindophenol (DCPIP), solid.  C12H7NCl2O2(s)  MW = 268.1 g mol-1  Not usually considered as hazardous. Check the supplier’s SDS.  CLEAPSS recipe sheet RB000 recipe 13. |
| Ascorbic acid (vitamin C) solution, 0.2 g dm-3 in 5% phosphoric acid.  C6H8O6(l)  Currently not classified as hazardous.  CLEAPSS hazcard HC038d. | Ascorbic acid solid.  C6H8O6(s)  MW = 176.12 g mol-1  Currently not classified as hazardous.  Phosphoric acid solution, 5% solution, equivalent to about 0.9 mol dm-3.  H3PO4(aq)  Currently not classified as hazardous.  See information above. |

**Tips and safety advice**

* The concentration of the DCPIP solution will not be accurate hence it is important to carry out Task 3, stage 1 (standardisation) of the experiment.

**Disposal**

* Dilute the cabbage solution and the 5% phosphoric acid solution to a concentration of 0.1 mol dm-3 phosphoric acid and the DCPIP solution to 0.1% before pouring down a foul-water drain.