

The bakery problem

Bakeries use several white substances. The manager of a bakery wants to know what simple tests they can use when labels from containers are lost or are unreadable.

You will be given samples of the powders, but these are all you have to work with. Once used up there are no more to test.

You should:

- plan what tests you might use (check with your teacher before using them)
- carry out the tests and record the results
- choose the tests that, together, make it easy to identify which substance is which.

Write a report for the bakery manager. All the tests you use and your results must be written up clearly. Write a conclusion about the easiest way(s) of identifying which substance is which.

The manager will be looking for:

- easy tests that give quick, unambiguous results
- evidence that health and safety regulations were followed
- evidence that good laboratory practice was used
- a report that is (a) accurate, (b) clear and (c) concise.

The six white substances

- Sugar (sucrose)
- Baking soda (sodium hydrogencarbonate)
- Salt (sodium chloride)
- Plain flour
- Citric acid
- Baking powder.

The bakery makes its own baking soda by mixing citric acid and plain flour.

Materials and equipment you may use

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| ▪ Dilute hydrochloric acid | ▪ Bunsen burner |
| ▪ Distilled water | ▪ Tripod |
| ▪ Test-tubes (including Pyrex ones) and ignition tubes | ▪ Gauze |
| ▪ Test-tube holder | ▪ Heat-proof mat |
| ▪ Test-tube rack | ▪ Clamp stand |
| ▪ Beakers | ▪ Balance |
| ▪ Glass dropper | ▪ Power pack, with leads and bulb |
| ▪ Glass stirring rod | ▪ Electrolysis cell |
| ▪ Spatula | ▪ Universal indicator solution |
| ▪ Microscope, slides and cover slips | ▪ Litmus |
| | ▪ Limewater |