



CHEMISTRY

C500

WARNING: Only for use by children over 10 years old. To be used solely under the strict supervision of adults who have studied the precautions given in the experimental set. Contains some chemicals which are classified as safety hazards. Read the instructions before use, follow them, and keep them for reference. Do not allow chemicals to come into contact with any part of the body, particularly mouth and eyes. Keep young children and pets away from experiments. Store the chemistry set out of reach of young children. Eye protection for supervising adults is not included.

WARNING — Science Education Set. This set contains chemicals and/or parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

What's in your experiment kit



Checklist: Find – Inspect – Check off

✓	No.	Description	Qty.	Item No.
<input type="checkbox"/>	1	Empty bottle for litmus solution (for production instructions, see p. 16) including safety cap with dropper insert	1	771501 704092
<input type="checkbox"/>	2	Litmus powder	1	771500
<input type="checkbox"/>	3	Potassium hexacyanoferrate(II)	1	033422
<input type="checkbox"/>	4	Ammonium iron(III) sulfate	1	033442
<input type="checkbox"/>	5	Sodium carbonate	1	033412
<input type="checkbox"/>	6	Tartaric acid	1	033472
<input type="checkbox"/>	7	Test tubes	3	062118
<input type="checkbox"/>	8	Double-headed measuring spoon	1	035017
<input type="checkbox"/>	9	Dropper pipettes	2	232134
<input type="checkbox"/>	10	Rubber stopper	1	071078
<input type="checkbox"/>	11	Safety glasses	1	052297
<input type="checkbox"/>	12	Lid remover	1	070177
<input type="checkbox"/>	13	Clip for 9-volt battery	1	042106

Please check all the parts against the list to make sure that nothing is missing. If you are missing any parts, please contact Thames & Kosmos customer service.

Additional things you will need:

Tealight candle, plate, knife, thin paintbrush or ink pen, yellow paper, white coffee filter or blotting paper, iron nail, matches, 9-volt battery, bar soap, liquid soap, shower gel, denatured alcohol (methylated spirits), light-colored table vinegar, table salt, lemon, sparkling water, distilled water, water, paper towels

Any materials not contained in the kit are marked in *italic script* in the “You will need” boxes.



Effervescent Powder Pages 9 to 14

Producing carbon dioxide



Soap or Body Wash Pages 27 to 34

What's in your soap?

Acids and Bases Pages 15 to 22

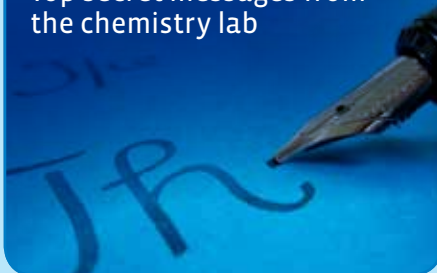
Acid or base?
Find out with the
litmus solution.



Prussian Blue and Invisible Ink Pages 35 to 41



Top secret messages from
the chemistry lab



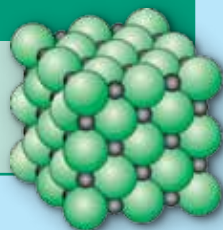
Still Water and Sparkling Water Pages 23 to 26

How acidic is your
mineral water?



Electrochemical Reactions Pages 42 to 48

Reactions at the
positive and
negative poles



CHECK IT OUT

You will find supplemental
information on pages 14, 22,
26, 34, 41, and 48.

EXPERIMENT 8

First blue, then red

YOU WILL NEED

- 2 test tubes
- measuring spoon
- stopper
- pipette
- litmus solution
- sodium carbonate
- tartaric acid
- *cup of white vinegar*
- *cup of water*

HERE'S HOW

1. Fill a test tube halfway with water and add 5 drops of litmus solution. Close the test tube with the stopper and shake so that the litmus solution is evenly distributed.
2. Color the blue solution light red with 2 drops of vinegar from the pipette. Divide the solution between two test tubes. You will need one of them now, and the other for the next experiment.

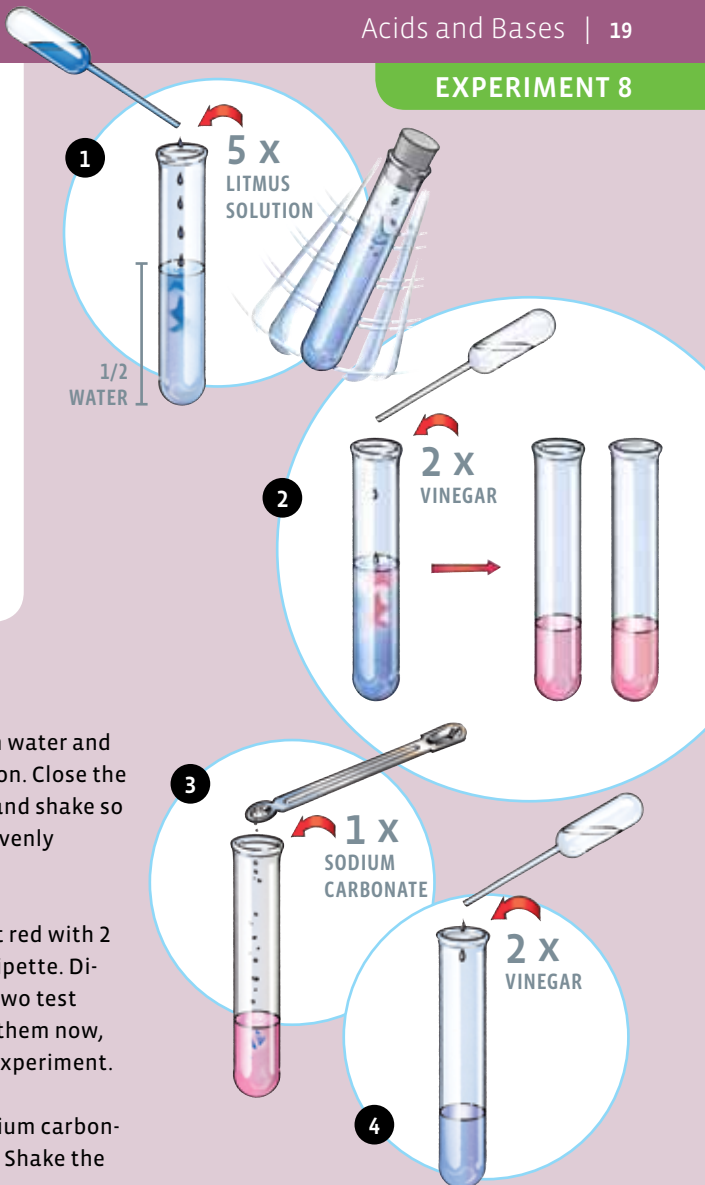
3. Add 1 small spoonful of sodium carbonate to one of the test tubes. Shake the solution a little.

What do you see?

4. Now add 2 drops of vinegar with the pipette.

What do you see now?

Safety Note: For sodium carbonate and tartaric acid, note the "Information about hazardous materials" on page 7!



→ WHAT'S HAPPENING?

The litmus dye is apparently unharmed by all this to and fro. Instead, it indicates whether acid (light red) or base or alkali (blue) has the upper hand. Some alkali (sodium hydroxide, or soda lye) is created when the sodium carbonate dissolves in water.

Now things get colorful!

YOU WILL NEED

- 3 test tubes
- measuring spoon
- stopper
- ammonium iron(III) sulfate
- potassium hexacyanoferrate(II)
- tartaric acid
- marker
- cup of water

HERE'S HOW

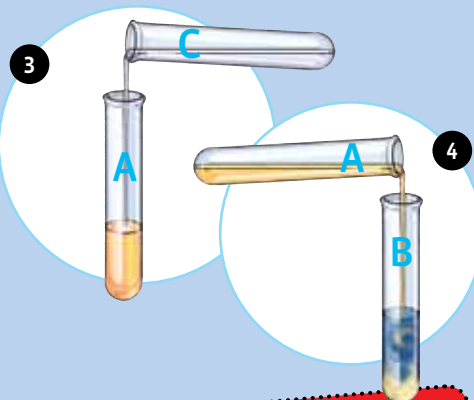
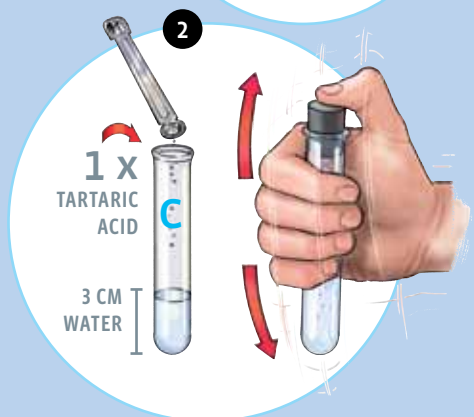
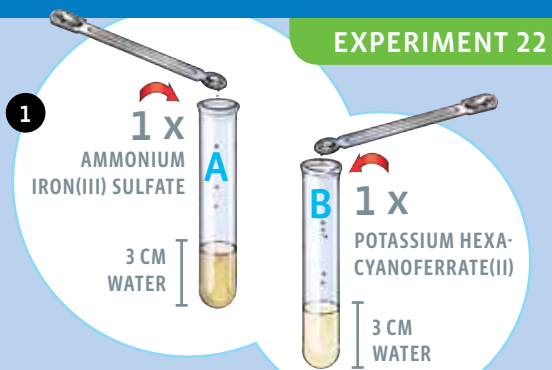
1. Mark one test tube with an "A" and a second one with a "B." Pour 3 cm of water in each test tube, and set them in your lab station. Add a small spoon tip of ammonium iron(III) sulfate to test tube A, and a small spoon tip of potassium hexacyanoferrate(II) to test tube B — just a few crystals in each case.
2. In the third test tube, "C," dissolve a small spoonful of tartaric acid in 3 cm of water. Insert the stopper and shake well!
3. Pour the colorless tartaric acid solution into test tube A. Insert the stopper and shake thoroughly!
4. Now pour the golden yellow solution from step 3 into test tube B.

What color is your solution?

Does the color change?

Safety Note: For tartaric acid, ammonium iron(III) sulfate, and potassium hexacyanoferrate(II), note the "Information about hazardous materials" on page 7! For potassium hexacyanoferrate(II), also note the environmental tip on page 37!

EXPERIMENT 22



→ WHAT'S HAPPENING?

The golden yellow solution is created by the action of tartaric acid on iron compounds. The blue solution, of course, is Prussian blue, which is more stable in acidic solutions than in alkaline ones.