STUFF AND SUBSTANCE: DISSOLVING 'GASES'

Ammonia is a substance in the gas state at room temperature. You are going to see what happens when it mixes with water.

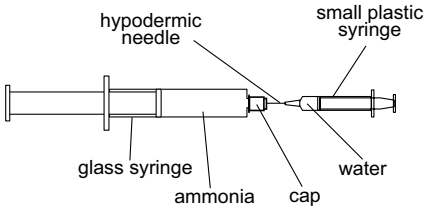
Carbonated water is a solution of carbon dioxide in water. You are going to find out how much carbon dioxide is in a bottle of carbonated water.

Ammonia is toxic. Use in a well-ventilated room or fume cupboard.

Task A Ammonia and water

1. In this demonstration, your teacher will use a glass syringe that contains 100 cm^3 ammonia. Using a syringe with a hypodermic needle, 1 cm^3 of water is injected into the glass syringe.

2. What do you observe? Can you explain what has happened? Use the ideas of the *particle model.*

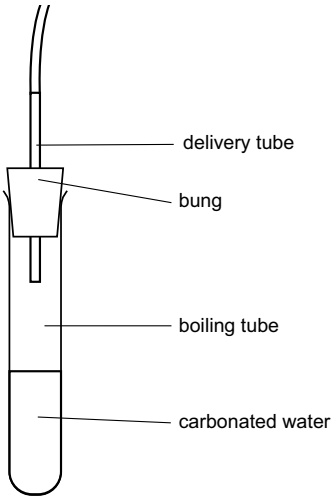


Task B How much carbon dioxide is in a bottle of carbonated water?

3. Your teacher will open a bottle of carbonated water. Why do you think that bubbles appear?

4. You will now investigate how much carbon dioxide remains dissolved in the water. You need to think about how you will get the carbon dioxide to come out, how to collect it and how to measure its volume. Some hints:

- shaking the solution gets more carbon dioxide to come out
- carbon dioxide is much less soluble at higher temperatures
- you can make a gas tight connection between a pipe and a plastic bag with sticky tape
- the bag could be put inside something to see how much volume it takes up.



5. How accurate is your value for the volume of carbon dioxide? Could you improve your method? (Think of where you might have lost some carbon dioxide. Could you have gained any air somewhere? Is there a better way of measuring the volume?)

6. Could you also find out how much carbon dioxide escapes when the bottle is first opened?

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