

## C3 – Analysis Quiz

1. What colour do calcium ions give in a flame test?

Brick red

2. What colour do lithium ions give in a flame test?

Crimson

3. What colour do sodium ions give in a flame test?

Yellow

4. What colour do potassium ions give in a flame test?

Lilac

5. What colour do barium and copper ions give in a flame test?

Green

6. If a substance contains both sodium and potassium ions, why is it difficult to identify both in a flame test?

Because the colours mix and the yellow is stronger than the lilac.

7. How do you test for chloride, bromide and iodide ions?

Add nitric acid to remove any carbonate present. Add silver nitrate solution to form a silver halide precipitate. Silver chloride is white, silver bromide cream and silver iodide pale yellow.

8. How do you test for carbonate ions?

Add an acid. If the solution fizzes, carbon dioxide is produced because carbonate ions were present.

9. How do you test for sulphate ions?

Add dilute hydrochloric acid to remove any carbonate ions. Add barium chloride to form a white precipitate of barium sulphate.

10. How do you test for aluminium, iron(II), iron(III), copper, calcium and magnesium ions?

Add sodium hydroxide to form precipitates: white aluminium hydroxide, green iron(II) hydroxide, orange iron(III) hydroxide, pale blue copper(II) hydroxide, white magnesium hydroxide, white calcium hydroxide.

11. How do you distinguish between aluminium, calcium and magnesium hydroxide?

Add excess sodium hydroxide. Aluminium hydroxide will dissolve. Do a flame test. Calcium hydroxide will give a red flame.

12. What piece of apparatus is used to measure out volumes of solutions?

Graduated pipette.

13. How do you read the volume off a burette?

From the bottom of the meniscus at eye level.

14. Name an indicator used in a titration.

Methyl orange or phenolphthalein.

15. How do you calculate moles from volume and concentration data?

Moles = concentration ( $\text{mol dm}^{-3}$ ) x volume ( $\text{cm}^3$ )/1000.

16. How do you use titration results to find the concentration of an unknown solution?

Use the titration volume and the concentration of the known chemical to find the moles of the known chemical used. Use the mole ratio from the equation and the moles of the known chemical to find the moles of the unknown chemical that reacted. Multiply the moles reacted by 1000 and divide by the volume that was in the flask. This is now the concentration in  $\text{mol dm}^{-3}$ .

17. How do you convert  $\text{mol dm}^{-3}$  to  $\text{g dm}^{-3}$ ?

Multiply the  $\text{mol dm}^{-3}$  by the Mr.

18. How do you carry out a titration?

Fill the burette with chemical A (known concentration). Use a pipette and place  $25\text{cm}^3$  of chemical B (unknown concentration) into a conical flask. Add 3-5 drops of indicator and place a white tile underneath the flask. Add chemical A  $1\text{cm}^3$  at a time to chemical B and swirl. Stop adding when the indicator changes colour. This is the end point. Repeat the experiment but add chemical A drop wise near the end point. Repeat the experiment until you have two concordant results.