



- a Describe and explain the trend in ionisation down group 2.

**ionisation energy decrease
atoms get bigger
more shielding
weaker attraction between nucleus and outer electron**

- b Explain why strontium has a lower melting point than calcium.

**Sr has weaker metallic bonding
due to bigger atoms/ions
giving weaker attraction between delocalised electrons and metal ions**

- c What would you see in each of the following reactions? If there is a reaction, write the simplest ionic equation.

addition of aqueous potassium sulfate to aqueous magnesium nitrate

no reaction

addition of aqueous sodium hydroxide to aqueous magnesium nitrate

**colourless solution to white precipitate
 $\text{Mg}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Mg}(\text{OH})_2(\text{s})$**

- d Sulfate ions in aqueous solution can be tested for using acidified barium chloride. Why is acid added before the barium chloride solution and identify a suitable acid.

**hydrochloric acid (or nitric acid)
to react with / remove carbonate ions
as they would also give a white precipitate like sulfate ions would**

- e Write an equation and give observations for the reaction of magnesium with steam.

**$\text{Mg} + \text{H}_2\text{O} \rightarrow \text{MgO} + \text{H}_2$
burns with bright white flame
forms white powder**

- f Write an equation and give observations for the reaction of calcium with water.

**$\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$
fizzes
forms white solid/precipitate**