2 The Group 2 elements Mg to Ba are all silvery-white reactive metals.

(a) **(i)** Draw a labelled diagram to show the bonding and structure of the Group 2 metals at room temperature.

[2]

(ii) Explain why Mg has a higher electrical conductivity than Na.

.....

..... [1]

(b) Write an equation for the reaction of magnesium with cold water.

..... [1]

(c) Identify a single reagent that can be used to distinguish separate samples of dilute $Mg(NO_3)_2(aq)$ and dilute $Ba(NO_3)_2(aq)$.

Explain your answer.

reagent .....

explanation .....

.....

[2]

(d) **(i)** Describe what is observed when $SrI_2(aq)$ reacts with concentrated sulfuric acid.

.....

..... [2]

(ii) Compound **X**, an anhydrous Group 2 bromide, is dissolved in water and titrated against aqueous silver nitrate.

A solution containing 0.250 g of **X** requires 33.65 cm^3 of 0.0500 mol dm^{-3} $AgNO_3(aq)$ for complete reaction.

Identify **X**.

Show your working.

X = ... [3]

[Total: 11]