

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

Q1.

This question is about sodium and some of its compounds.

- (a) Use your knowledge of structure and bonding to explain why sodium bromide has a melting point that is higher than that of sodium, and higher than that of sodium iodide.

(6)

- (b) When 250 mg of sodium were added to 500 cm³ of water at 25 °C a gas was produced.

Give an equation for the reaction that occurs.

Calculate the volume, in cm³, of the gas formed at 101 kPa

The gas constant, $R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$

Equation _____

Volume _____ cm³

(6)

- (c) Calculate the concentration, in mol dm⁻³, of sodium ions in the solution produced in the reaction in **part (b)**.

Concentration _____ mol dm⁻³

(1)

- (d) Sodium reacts with ammonia to form the compound NaNH₂ that contains the NH₂⁻ ion.

Draw the shape of the NH₂⁻ ion.

Include any lone pairs of electrons that influence the shape.

Predict the bond angle.

Justify your prediction.

Shape

Bond angle _____

Justification _____

(4)

(Total 17 marks)