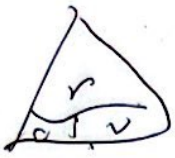
Leave blank

(ii) Calculate the amount (moles) of copper(II) sulphate, $CuSO_4$, in 50 cm^3 of 0.50 mol dm^{-3} solution.

0.05 dm^3.



$0.5 \times 0.05 = 0.025$ mol

(1)

(iii) Calculate the heat evolved in the reaction. Include units with your answer.

Assume that the total mass of the solution is 50 g and that the specific heat capacity of the solution is 4.18 J g^{-1} °C^{-1}.

$Q = mc\Delta T$

$= 50 \times 4.18 \times 15.5$

$= 3239.5$ J

3.2395 kJ

(1)

(iv) Use your answers from (c)(ii) and (iii) to calculate the **molar** enthalpy change for the reaction. Give your answer in kJ mol^{-1} and to **two** significant figures. **Include a sign** with your answer.

$\Delta H = -\frac{Q}{n} = -\frac{3.2395}{0.025} = -129.58$

ΔH = -130 ..... kJ mol^{-1}

(3)

(d) A student suggests repeating the experiment using 100 cm^3 of the same copper(II) sulphate solution and twice the mass of zinc. What effect, if any, will this have on the temperature change? Explain your answer.

it will decrease

(1)

Q3

(Total 15 marks)