

Heat of precipitation

Answer the following questions

What is the meaning of heat of precipitation?

Heat _____ when _____ of _____ formed

Question 1

In an experiment to find the heat of precipitation of magnesium carbonate, 25 cm^3 of magnesium nitrate 2.0 mol dm^{-3} is added into 25 cm^3 of sodium carbonate solution, 2.0 mol dm^{-3} in a container. The temperature of the solution decreases by 6°C . What is the heat of precipitation of magnesium carbonate? [Specific heat capacity of the solution = $4.2\text{ J g}^{-1}\text{C}^{-1}$; density of the solution = 1 g/cm^3]

a) What is the mass of the solution?

g

b) What is the difference of temperature in the reaction?

$^\circ\text{C}$

c) Calculate the heat change for this reaction

$$Q = (\quad) (\quad) (\quad) = \quad \text{kJ}$$

d) What is the number of mole of the solution?

$$\underline{\quad} \times \underline{\quad} = \quad \text{mol}$$

e) Calculate the heat of precipitation of magnesium carbonate

$$\Delta H = \underline{\quad} = \quad \text{kJ mol}^{-1}$$

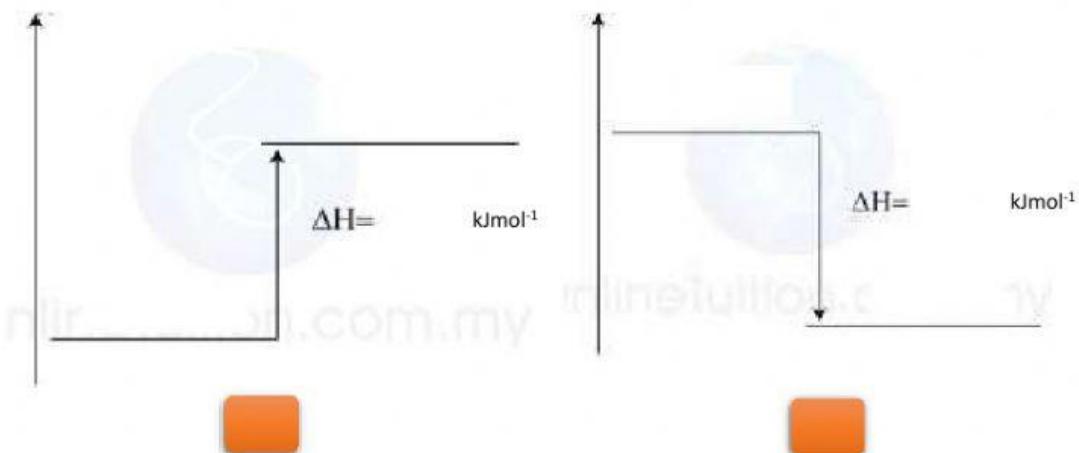
f) Write the chemical reaction for this experiment



g) Write the ionic equation for the experiment



h) Choose the right energy level diagram. Complete the energy level diagram.
(write 0 for the blank box that not chosen)



Question 2

An experiment is carried out to determine the heat of precipitation of barium sulphate. In this reaction, 25cm^3 of 1.0mol dm^{-3} barium chloride, is poured into a polystyrene cup and the initial temperature of solution is recorded. 25cm^3 of 1.0mol dm^{-3} of sodium sulphate solution is poured into the same polystyrene cup. The resulting solution mixture is stirred and the highest temperature is recorded. The recorded temperatures are shown below.

Initial temperature = 29°C

Highest temperature reached by the solution = 34°C

Calculate the heat of precipitation of barium sulfate and draw an energy level diagram for the reaction in this experiment

a) What is the mass of the solution?

g

b) What is the difference of temperature in the reaction?

$^\circ\text{C}$

c) Calculate the heat change for this reaction

$$Q = (\quad) (\quad) (\quad) = \quad \text{kJ}$$

d) What is the number of mole of the solution?

$$\frac{x}{\quad} = \quad \text{mol}$$

e) Calculate the heat of precipitation of magnesium carbonate

$$\Delta H = \quad = \quad \text{kJmol}^{-1}$$

f) Write the chemical reaction for this experiment



g) Write the ionic equation for the experiment



h) Choose the right energy level diagram. Complete the energy level diagram.
(write 0 for the blank box that not chosen)

