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 $moldm^{-3}$ 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 $Jg^{-1}°C^{-1}$; 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?

°C

c) Calculate the heat change for this reaction

Q = ( ) ( ) ( ) = J = kJ

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

_____x_____ = mol

e) Calculate the heat of precipitation of magnesium carbonate

ΔH = _____ = $kJmol^{-1}$

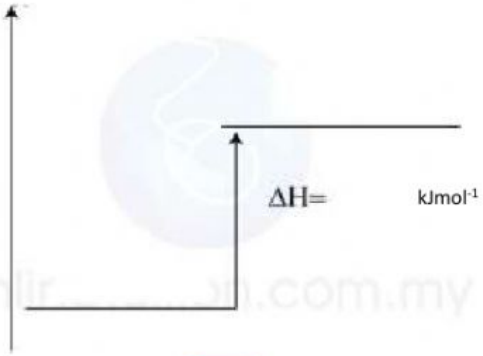
f) Write the chemical reaction for this experiment

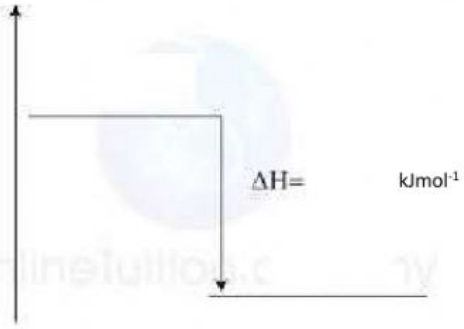
\+ ( ) → +

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)





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?

^oC

c) Calculate the heat change for this reaction

Q = ( ) ( ) ( ) = J = kJ

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

_____x_____ = mol

e) Calculate the heat of precipitation of magnesium carbonate

ΔH = _____ = 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)