

Answer on Question #55535 - Chemistry - General chemistry

Answer:

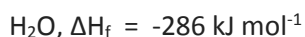
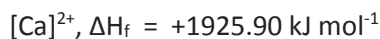
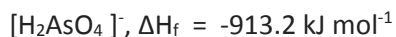
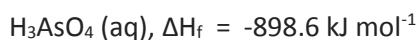
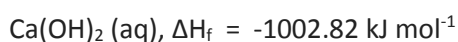
1. The required heat is determined by the equation:

$Q = mC\Delta t$, where m - the mass of lead, C - the specific heat capacity, Δt - the temperature change ($\Delta t = 37\text{ }^\circ\text{C} - 22\text{ }^\circ\text{C} = 15\text{ }^\circ\text{C}$).

Thus,

$$Q = 35\text{ g} \times 0.13\text{ J g}^{-1}\text{ K}^{-1} \times 15\text{ }^\circ\text{C} = \mathbf{68.25\text{ J}}$$

2. The standard enthalpy change of formation of the reagents and the products are:



According to Hess's law the enthalpy change for the reaction is:

$$\Delta H = 2 \Delta H_f(\text{H}_2\text{O}) + \Delta H_f(\text{Ca}^{2+}) + 2 \Delta H_f([\text{H}_2\text{AsO}_4]^{-}) - \Delta H_f(\text{Ca(OH)}_2) - 2\Delta H_f(\text{H}_3\text{AsO}_4)$$

$$\begin{aligned} \Delta H &= -572\text{ kJ mol}^{-1} + 1925.90\text{ kJ mol}^{-1} - 1826.4\text{ kJ mol}^{-1} + 1002.82\text{ kJ mol}^{-1} + 1797.2\text{ kJ mol}^{-1} = \\ &= \mathbf{+2327.52\text{ kJ mol}^{-1}} \end{aligned}$$

3.

True/False questions:

G) The enthalpy change of a reaction is the reciprocal of the ΔH of the reverse reaction.

true

H_f , the standard enthalpy of formation of a compound, is the change in enthalpy for the ΔH reaction that forms one mole of the compound from elements with all substances in their standard state. true

I) The enthalpy of a reaction is equal to the heat of the reaction. false

J) When work is done on a system, w will be a negative value. false

K) Bomb calorimeter measures q which is ΔH . true

L) Standard state of a substance is its pure form at atmospheric pressure (1 atm) and the temperature of $0\text{ }^\circ\text{C}$. false