1. Calculate the enthalpy of combustion of propane, \( \text{C}_3\text{H}_8(g) \), given the following data.

\[
\Delta H_{\text{C}_3\text{H}_8(g)} = -104 \text{ kJ mol}^{-1} \quad \Delta H_{\text{C}(s)} = -394 \text{ kJ mol}^{-1} \quad \Delta H_{\text{H}_2(g)} = -286 \text{ kJ mol}^{-1}
\]

2. Pentane is a good fuel that burns well in oxygen. \( \text{C}_5\text{H}_{12}(l) + 8\text{O}_2(g) \rightarrow 5\text{CO}_2(g) + 6\text{H}_2\text{O}(l) \)

   a. Calculate the enthalpy change for this reaction given the following enthalpies of formation:

\[
\Delta H / \text{kJ mol}^{-1} \quad \text{C}_5\text{H}_{12}(l) = -147 \quad \text{CO}_2(g) = -394 \quad \text{H}_2\text{O}(l) = -286
\]

   b. 1.56 g of pentane was burned in a spirit burner and used to heat 100.0 g of water in a copper calorimeter. The temperature of the water rose by 28°C. Calculate the enthalpy of combustion of pentane determined by this experiment. The specific heat capacity of the solution is 4.18 J K\(^{-1}\) g\(^{-1}\).

   c. Suggest two reasons why the values obtained in a and b differ, and which is the correct value.

   Correct value: 

   1. 

   2. 