ENERGETICS (B)

1 Calculate the enthalpy of combustion of propane, $C_3H_8(g)$, given the following data.

$\Delta_fH\ C_3H_8(g) = -104\ kJ\ mol^{-1}$ $\Delta_cH\ C(s) = -394\ kJ\ mol^{-1}$ $\Delta_cH\ H_2(g) = -286\ kJ\ mol^{-1}$

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2 Pentane is a good fuel that burns well in oxygen. $C_5H_{12}(l) + 8O_2(g) \rightarrow 5CO_2(g) + 6H_2O(l)$

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

Δ_fH / kJ mol^{-1} $C_5H_{12}(l) = -147$ $CO_2(g) = -394$ $H_2O(l) = -286$

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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}.

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

Correct value: .....

1 .....

2 .....