JQ.2.16

September 12, 2014

(2.16) Determine the heat of combustion of toluene and express it in proper thermodynamic form. The heat of formation is 11.95 kcal/mole.

This is essentially the same type of analysis as problem 2.8.

Step 1: Balance the chemical reaction using elemental balances:

$$C_m H_n + aO_2 \rightarrow bCO_2 + dH_2O$$

Find the stoichiometric coefficients a, b,& d.

Step 2: Use equation 2.25 to express the heat of combustion in terms of the heats of formation

$$\Delta\tilde{h}_c = \left(\sum_i \nu_i \Delta\tilde{h}^o_{f,i}\right)_{React} - \left(\sum_j \nu_j \Delta\tilde{h}^o_{f,j}\right)_{Prod}$$

In []: