WW5: Standard Enthalpy Formation & Hess' Law

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1. Calculate the heat combustion at constant pressure of liquid ethanol.

The given reaction which shows the combustion of liquid ethanol:

$$C_2H_5OH(l) + 3O_2(g) \longrightarrow 2CO_2(g) + 3H_2O(l)$$

$\Delta H_f°$ [Reactants]:
$C_2H_5OH_{(l)}$ = -277.69 kJ/mol
$O_2{}_{(g)}$ = 0 kJ/mol

$\Delta H_f°$ [Products]:
$CO_2{}_{(g)}$ = -393.509 kJ/mol
$H_2O_{(l)}$ = -285.83 kJ/mol

$\Delta H°_{rxn} = \Sigma nH°_f$ [Products] $- \Sigma nH°_f$ [Reactants]
$\Delta H°_{rxn}$ = [2(-393.509) + 3(-285.83)] - [-277.69 + 3(0)]
$\Delta H°_{rxn}$ = [-787.018 + -857.49] - [-277.69]
$\Delta H°_{rxn}$ = (-1644.98) - (-277.69)
$\Delta H°_{rxn}$ = -1367.29