

#9-4
Delta H of formation

Rules

1. Collect data
2. Multiply by coefficient
3. Sum all products
4. Sum all reactants
5. Subtract products from reactants

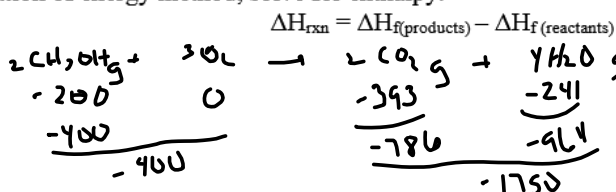


Thermodynamic values

1. Methanol (CH₃OH), Write the combustion reaction for methanol. (CH₃OH)



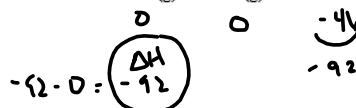
2. Conservation of energy method, solve for enthalpy.



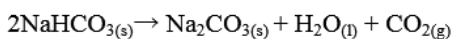
εp-εr
-1750 + 1100
ΔH = -1350 kJ/rxn

3. (brown581) Using the standard heat of formation data, in your workbook,

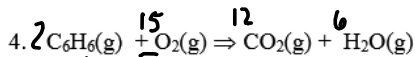
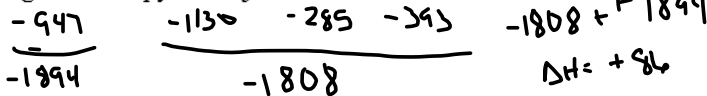
a. Determine the ΔH° for the following reaction: N_{2(g)} + 3H_{2(g)} ⇌ 2NH_{3(g)}



4. Some chefs keep baking soda, NaHCO₃, handy to put out grease fires. When thrown on the fire, baking soda partly smothers the fire, and the heat decomposes it to give CO₂, which further smothers the flame.

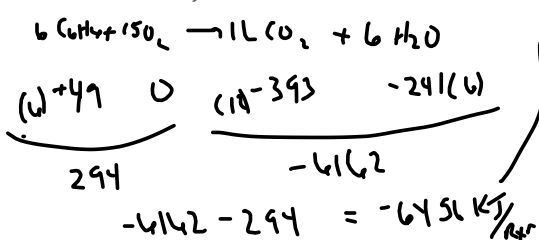


Using ΔH tables calculate change in enthalpy in kilojoules.



a) Calculate the standard enthalpy change for the combustion of 1 mol of benzene, C₆H_{6(l)}.

b) Determine the heat of combustion per gram. (proportional factor label, try it!)



1 mol · $\frac{-6456 \text{ kJ}}{2 \text{ mol}} = -3228 \text{ kJ}$

$\frac{3228 \text{ kJ}}{1 \text{ mol}} \cdot \frac{1 \text{ mol}}{78 \text{ g}} = 41.3 \text{ kJ/g}$