

Enthalpy & Hess's Law

enthalpy (H) - measurement of the amount of energy produced/absorbed by a chemical heat exothermic endothermic

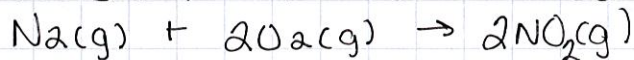
heat (q) - change in enthalpy at constant pressure

Hess's Law

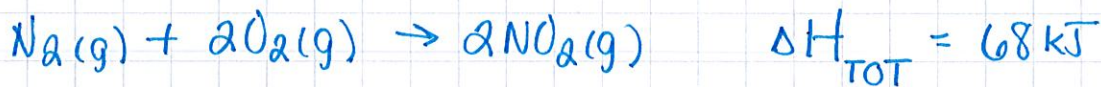
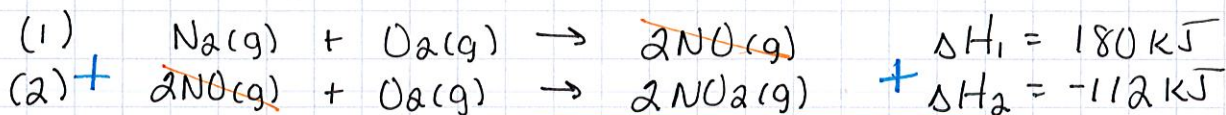
Regardless of the multiple steps of a reaction, the total change in enthalpy (ΔH) for a reaction is the SUM of all the changes.

Examples

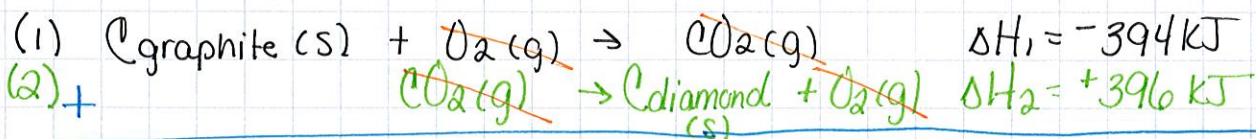
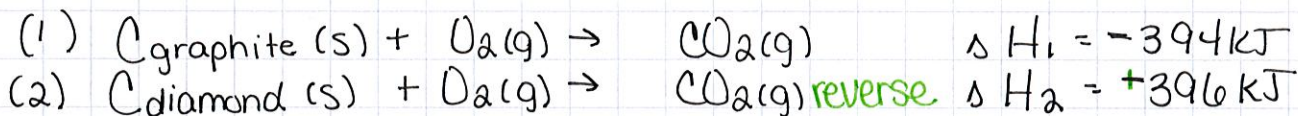
(1) Calculate ΔH for the overall reaction:



given the steps:

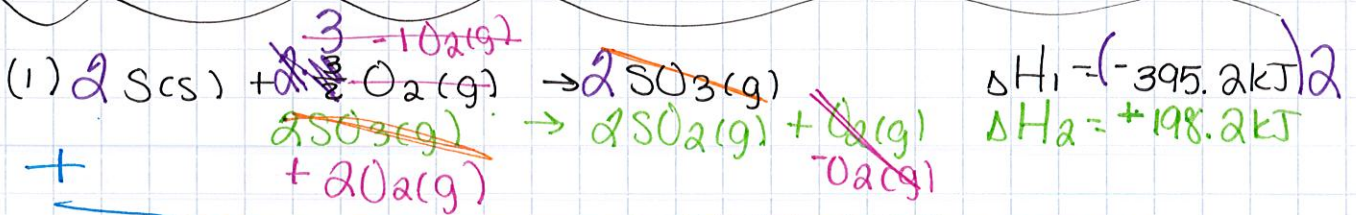
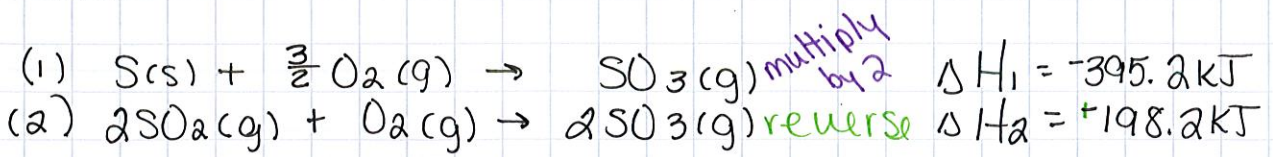


(2) Calculate ΔH for: $\text{C}_{\text{graphite}}(\text{s}) \rightarrow \text{C}_{\text{diamond}}(\text{s})$
from:



In order to solve a problem, you can reverse or flip a reaction to get a substance on the correct side of the equation. Don't forget to change the sign of ΔH !

3. Calculate ΔH for: $S(s) + O_2(g) \rightarrow SO_2(g)$
from:



The magnitude of ΔH is directly proportional to the quantities of reactants & products. You can multiply whole equations in any step to solve the problem. And you can even subtract individual substances on both sides of the equations.

4. Calculate ΔH for: $C(s) + H_2O(g) \rightarrow CO(g) + H_2(g)$
from:

