AP Chemistry Daily Videos: 6.8 Enthalpy of Formation

Daily Video #1

1. Review: What is the Enthalpy of Reaction, ΔH_{rxn}?

2. What is the standard enthalpy of formation, ΔH°_{f}?

3. What does the $^{\circ}$ refer to or tell us?

4. What is standard state? Give a few examples?

5. When you are given CO_2 and ΔH°_{f} = -393.5 kJ/mol, what does that mean?

6. What is the ΔH°_{f} value for an element in its pure state? ΔH°_{f} = _____

7. Given the following values, sketch a diagram to help you explain the difference of enthalpy formations for the following substances using the sea level analogy.

Formula	ΔH°_{f} (kJ/mol)
F (*g*)	79.38
F_2 (*g*)	0
H_2(*g*)	0
HF (*g*)	-273.3

8. Big takeaways?

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Daily Video #2

1. What is the equation for calculating the ΔH°_{rxn}?

2. What are the two key things to keep in mind when calculating ΔH°_{rxn}?

3. Complete this practice problem along with Ms. Scimeca.

Using the table of standard enthalpies of formation below, determine the standard enthalpy change of the reaction when 2.00 moles of propene combust. The balanced equation for the combustion of 2.00 moles of propene is $2\ C_3H_6(g) + 9\ O_2(g) \rightarrow 6\ CO_2(g) + 6\ H_2O(g)$.

Substance	$C_3H_6(g)$	$CO_2(g)$	$O_2(g)$	$H_2O(g)$
Standard Enthalpy of Formation (kJ/mol)	21	-394	0	-242

4. Pause the video at 3:30, attempt the problem, then evaluate how you did and identify any errors.

$3\ C_2H_2(g) \rightarrow C_6H_6(g)$

What is the standard enthalpy change ΔH°, for the reaction represented above? ΔH°_f of $C_2H_2(g)$ is 230 kJ mol^{-1}; ΔH°_f of $C_6H_6(g)$ is 83 kJ mol^{-1}.

a) – 607 kJ
b) – 147 kJ
c) – 19 kJ
d) + 19 kJ
e) + 773 kJ

5. Pause the video at 4:38, attempt the problem, then evaluate how you did and identify any errors.

$4\ NH_3(g) + 3\ O_2(g) \rightarrow 2\ N_2(g) + 6\ H_2O(g)$

If the standard molar heats of formation of ammonia, $NH_3(g)$, and gaseous water, $H_2O(g)$, are –46 kJ/mol and –242 kJ/mol, respectively, what is the value of ΔH°_{298} for the reaction represented above?

a) – 190 kJ/mol_{rxn}
b) – 290 kJ/mol_{rxn}
c) – 580 kJ/mol_{rxn}
d) – 1,270 kJ/mol_{rxn}
e) – 1,640 kJ/mol_{rxn}

6. Key takeaways?