

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 $\Delta H_f^\circ = -393.5 \text{ kJ/mol}$, what does that mean?
6. What is the ΔH_f° value for an element in its pure state? $\Delta H_f^\circ = \underline{\hspace{2cm}}$
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?

Daily Video #2

1. What is the equation for calculating the $\Delta H^\circ_{\text{rxn}}$?

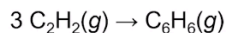
2. What are the two key things to keep in mind when calculating $\Delta H^\circ_{\text{rxn}}$?

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 $2 \text{C}_3\text{H}_6(g) + 9 \text{O}_2(g) \rightarrow 6 \text{CO}_2(g) + 6 \text{H}_2\text{O}(g)$.

Substance	$\text{C}_3\text{H}_6(g)$	$\text{CO}_2(g)$	$\text{O}_2(g)$	$\text{H}_2\text{O}(g)$
Standard Enthalpy of Formation (kJ/mol)	21	-394	0	-242

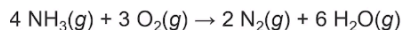
4. Pause the video at 3:30, attempt the problem, then evaluate how you did and identify any errors.



What is the standard enthalpy change ΔH° , for the reaction represented above? ΔH°_f of $\text{C}_2\text{H}_2(g)$ is 230 kJ mol^{-1} ; ΔH°_f of $\text{C}_6\text{H}_6(g)$ is 83 kJ mol^{-1} .

- a) -607 kJ
- b) -147 kJ
- c) -19 kJ
- d) $+19 \text{ kJ}$
- e) $+773 \text{ kJ}$

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



If the standard molar heats of formation of ammonia, $\text{NH}_3(g)$, and gaseous water, $\text{H}_2\text{O}(g)$, are -46 kJ/mol and -242 kJ/mol , respectively, what is the value of ΔH°_{298} for the reaction represented above?

- a) $-190 \text{ kJ/mol}_{\text{rxn}}$
- b) $-290 \text{ kJ/mol}_{\text{rxn}}$
- c) $-580 \text{ kJ/mol}_{\text{rxn}}$
- d) $-1,270 \text{ kJ/mol}_{\text{rxn}}$
- e) $-1,640 \text{ kJ/mol}_{\text{rxn}}$

6. Key takeaways?