Hess’s Law – Study Guide

*section 5.3 in OpenStax*

**Hess’s Law**

If a chemical equation can be expressed as the sum of a series of steps, then ΔH for the overall equation is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If a chemical equation is multiplied by some factor, then ΔH is also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*example*: if 2 CO(g) + O2 (g)  → 2 CO2 (g)  ΔH = -566 kJ

then 6 CO(g) + 3 O2 (g)  → 6 CO2 (g)  ΔH = \_\_\_\_\_\_\_\_\_ (ans. -1698 kJ)

If a chemical equation is reversed, then the sign of ΔH is also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

***Watch the video tutorial on*** [Hess’s Law](https://www.youtube.com/watch?v=0lRcq7d2uLE&feature=youtu.be)

*example:*

if 3 H2(g) + N2(g) → 2 NH3(g) ΔH = – 69 kJ

4 H2(g) + 2 NO2(g) → N2(g) + 4 H2O(g) ΔH = – 255 kJ

What is ΔH for the following reaction?

7 H2(g) + 2 NO2(g) → 2 NH3(g) + 4 H2O(g) ΔH = \_\_\_\_\_\_\_\_\_.

*(ans: – 324 kJ)*

**End of Chapter Practice Problems**

#63, 65, 67, 81

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”