

AP Chemistry Daily Videos

9.6 Coupled Reactions

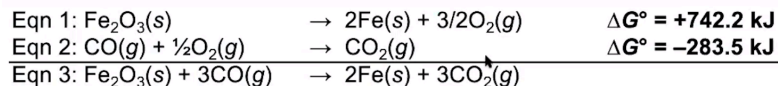
Video #1

1. What are two ways to force a thermodynamically unfavorable ($\Delta G = \text{positive}$) reaction to occur?

2. What is meant by a coupled reaction?

3. Explain how you can use the technique of Hess's Law to obtain an overall ΔG that is negative in this problem.

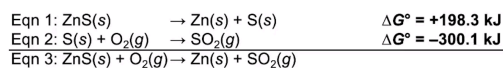
Decomposition of Iron(III) Oxide via Coupling



The decomposition of iron(III) oxide (represented by Equation 1) can be accomplished by coupling the reaction to the combustion of carbon monoxide (represented in Equation 2), which results in the overall reaction represented in Equation 3.

- Determine the free energy change for the reaction represented in Equation 3.
- Explain why the reactions represented in Equations 1 and 2 are suitable for coupling to produce a thermodynamically favorable process.

4. How well did you do on the second problem?



The decomposition of zinc sulfide (represented by Equation 1) can be accomplished by coupling the reaction to the combustion of sulfur (represented in Equation 2), which results in the overall reaction represented in Equation 3.

- Determine the free energy change for the reaction represented in Equation 3.
- Explain why the reactions represented in Equations 1 and 2 are suitable for coupling to produce a thermodynamically favorable process.