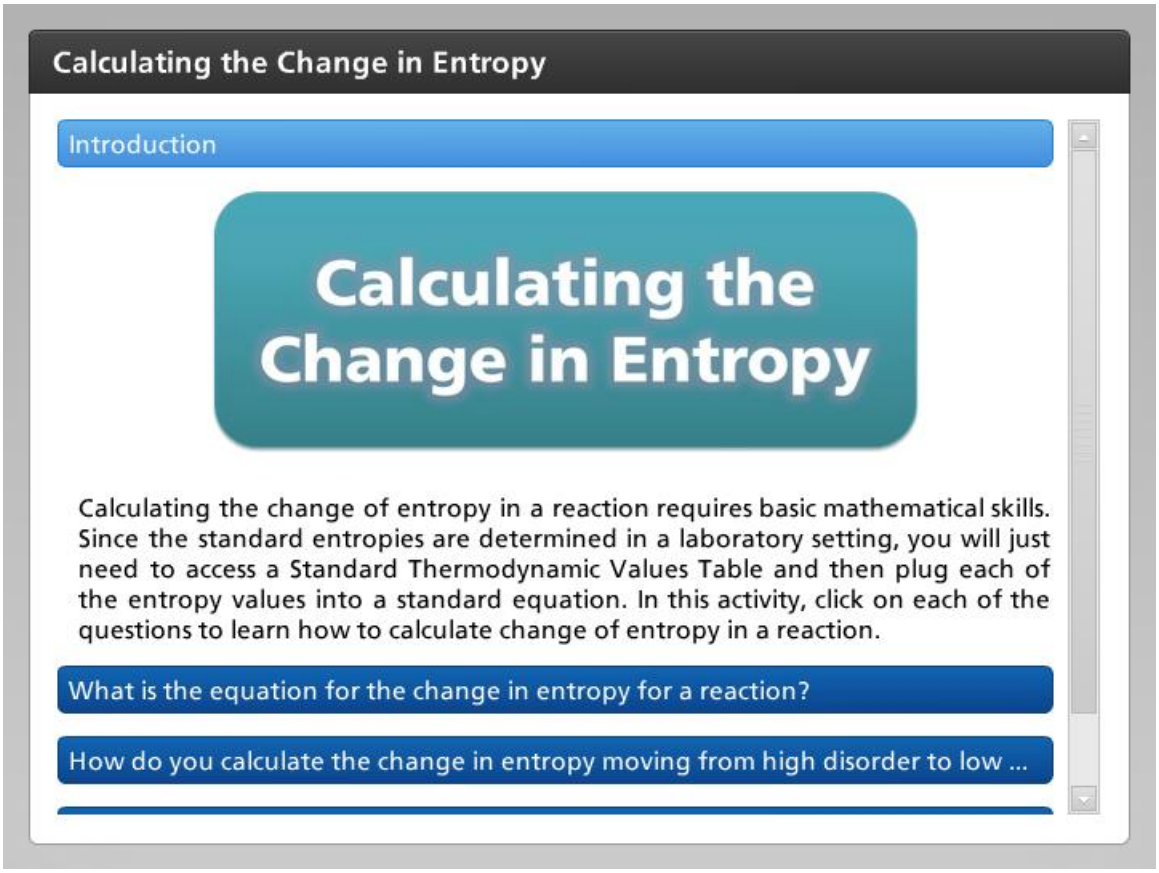
Module 8: Thermochemistry
Topic 4 Content: Calculating the Change in Entropy Notes

Introduction



Calculating the change of entropy in a reaction requires basic mathematical skills. Since the standard entropies are determined in a laboratory setting, you will just need to access a Standard Thermodynamic Values Table and then plug each of the entropy values into a standard equation. In this activity, click on each of the questions to learn how to calculate change of entropy in a reaction.

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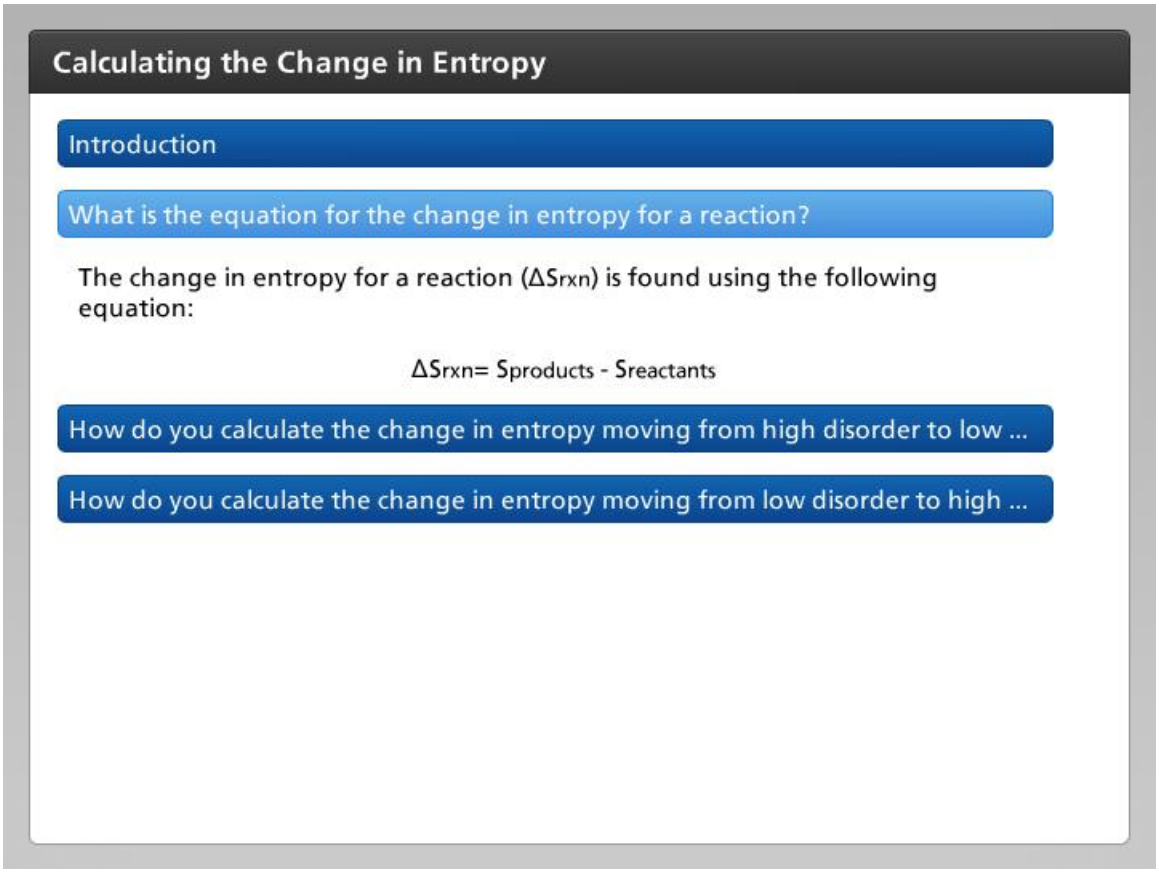
What is the equation for the change in entropy for a reaction?



The change in entropy for a reaction (ΔS_{rxn}) is found using the following equation:

$$\Delta S_{rxn} = S_{products} - S_{reactants}$$

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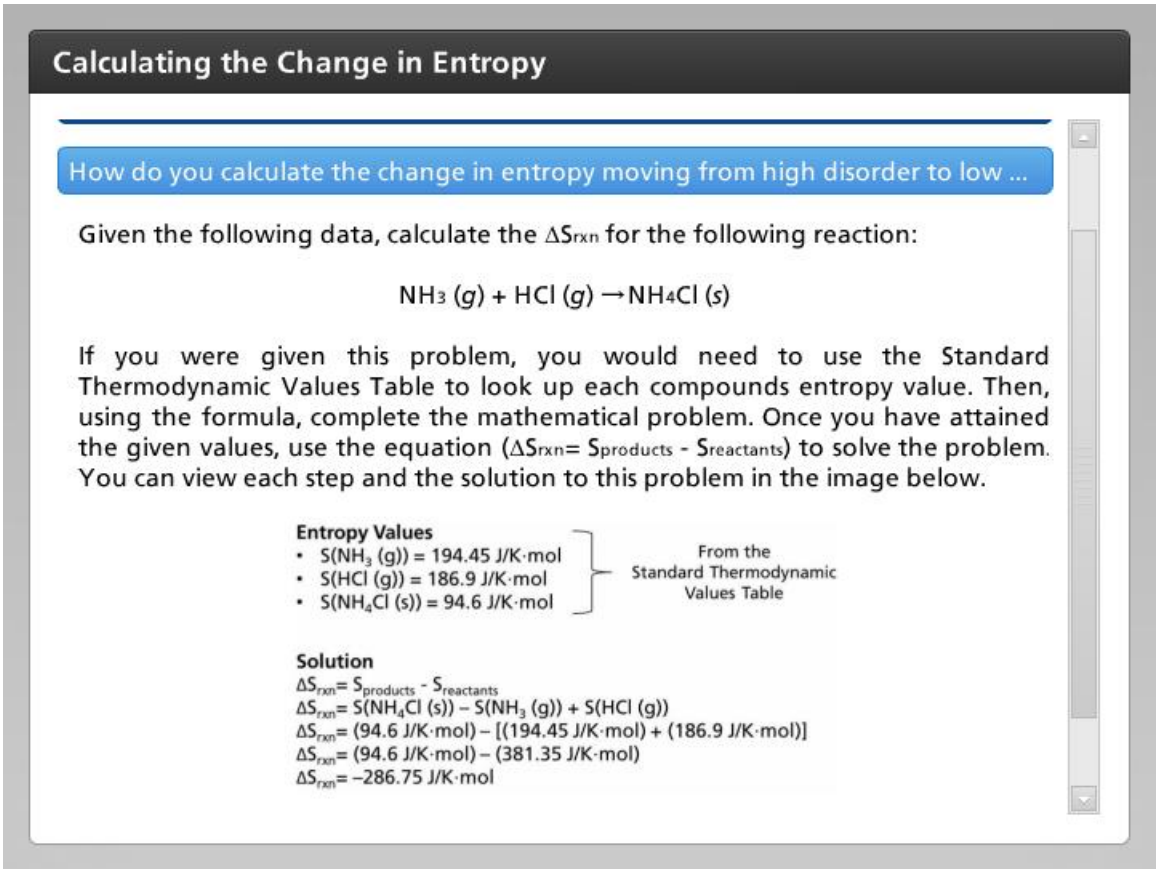
How do you calculate the change in entropy moving from high disorder to low disorder?



Given the following data, calculate the ΔS_{rxn} for the following reaction:

$$NH_3\,(g) + HCl\,(g) \rightarrow NH_4Cl\,(s)$$

If you were given this problem, you would need to use the Standard Thermodynamic Values Table to look up each compounds entropy value. Then, using the formula, complete the mathematical problem. Once you have attained the given values, use the equation ($\Delta S_{rxn} = S_{products} - S_{reactants}$) to solve the problem. You can view each step and the solution to this problem in the image below.

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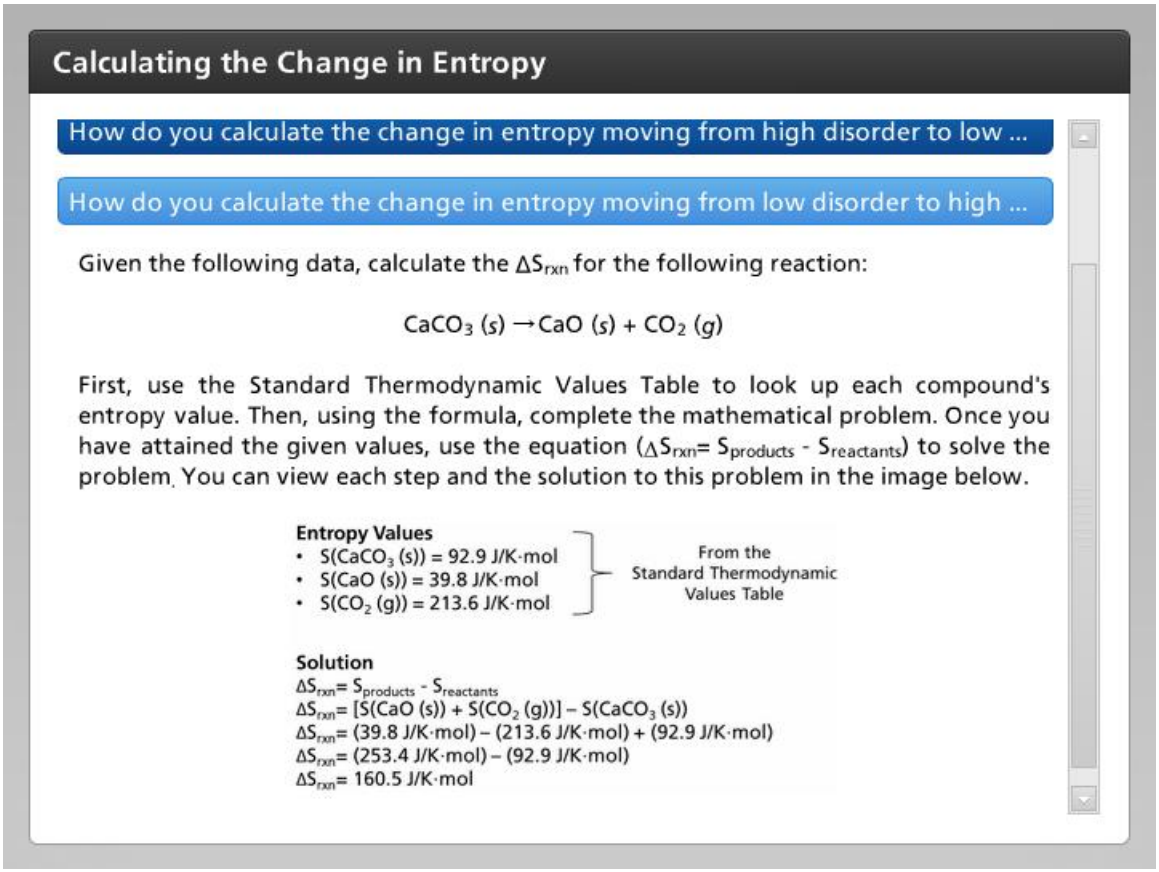
How do you calculate the change in entropy moving from low disorder to high disorder?



Given the following data, calculate the ΔS_{rxn} for the following reaction:

$$CaCO_3\ (s) \rightarrow\ CaO\ (s) + CO_2\ (g)$$

First, use the Standard Thermodynamic Values Table to look up each compound's entropy value. Then, using the formula, complete the mathematical problem. Once you have attained the given values, use the equation ($\Delta S_{rxn}= S_{products} - S_{reactants}$) to solve the problem. You can view each step and the solution to this problem in the image below.