

12-2 Review and Reinforcement

Heat and Enthalpy Changes

Complete each of the following sentences by filling in the appropriate word or phrase from the list below.

- | | | |
|--------|--------------------------|----------|
| less | endothermic | change |
| moles | exothermic | pressure |
| energy | standard enthalpy change | enthalpy |

1. The heat absorbed or released in a reaction depends on a quantity called _____.
2. The enthalpy of a substance is similar to, but not exactly the same as, the _____ of a substance.
3. The symbol ΔH literally means a _____ in enthalpy.
4. The ΔH for a(n) _____ reaction always has a positive sign.
5. In an exothermic reaction, H_{products} will always be _____ than $H_{\text{reactants}}$.
6. Conditions such as temperature, _____, and the physical states of the substances in a reaction can affect ΔH .
7. The enthalpy change measured at 1 atm and 25°C , when the reactants and products are in their standard states, is called a _____.
8. You must know the number of _____ of reactants involved in a reaction to calculate ΔH .

Answer each of the following questions in the space provided.

9. How is the enthalpy of a substance related to the energy of a substance?

10. If you were given ΔH° of a reaction, could you determine whether the reaction was exothermic or endothermic? Explain your answer.

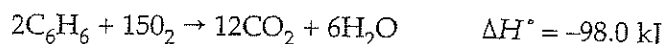
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11. Compare the enthalpy of the reactants and the products in both exothermic and endothermic reactions.

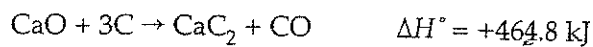
12. What is meant by the standard state of an element?

Solve each of the following problems as directed. Show all your work.

13. Calculate the amount of heat released by the combustion of 1.75 mol of benzene (C_6H_6).



14. How much heat is transferred when 100.0 g of calcium oxide (CaO) reacts with carbon according to the equation below? Is this reaction endothermic or exothermic?



15. Ammonium dichromate decomposes in a vigorous reaction when it is heated. Calculate the heat transferred for the decomposition of 53.0 g of ammonium dichromate according to the following equation.

