

Unit 5 Reading Assignment

Learning Objectives in this Unit:

- *Identify various forms of energy, interconversion between these forms, and its role in physical processes and chemical reactions*
- *Perform calculations using standard enthalpies of formation, standard enthalpy of reaction, standard enthalpy of combustion and Hess's Law*
- *Conduct simple calorimetry experiments and perform calculations to determine if a process or a chemical reaction is endothermic or exothermic*

Read more about these topics: [Chapter 5](#)

1. Fill in the blanks

Energy is the capacity to supply [_____] or do [_____].

During a chemical or physical change, [_____] can be neither created nor [_____].

2. Fill in the blank with either “endothermic” or “exothermic”

A process that releases heat is [_____]. A process that absorbs heat is [_____]

3. Which of the following substances would require the greatest quantity of heat to raise the temperature of 1.0 gram of the substance by 1 °C?

- Gold ($c = 0.129 \text{ J/g } ^\circ\text{C}$)
- Copper ($c = 0.385 \text{ J/g } ^\circ\text{C}$)
- Argon ($c = 0.522 \text{ J/g } ^\circ\text{C}$)
- Aluminum ($c = 0.897 \text{ J/g } ^\circ\text{C}$)

4. Fill in the blanks

During an endothermic reaction the temperature of the surroundings [_____]. And the enthalpy change (ΔH) is [_____].

During an exothermic reaction the temperature of the surroundings [_____]. And the enthalpy change (ΔH) is [_____]

5. Select all of the true statements for a calorimetry experiment

- The heat produced by the reaction equals the amount of heat absorbed by the solution
- The heat produced by the reaction must be zero
- $q(\text{reaction}) = -q(\text{solution})$
- $q(\text{reaction}) + q(\text{solution}) = 0$
- The heat lost by the solution equals the amount of heat produced by the reaction

6. Fill in the blanks

Internal [_____] and enthalpy are both [_____] functions, which means the value only depends on the [_____] that a system is in not on how it was reached.

7. Identify whether the following statement is true or false.

The enthalpy change of a reaction depends on the physical states

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8. What is the standard enthalpy of formation for an element in its most stable form under standard conditions (1 atm or 1 M)?

9. Fill in the blanks

Standard enthalpy of formation is a change for a reaction where exactly [_____] mole of a pure substance is formed from elements in their most [_____] states under [_____] state conditions