

Chapter 17 Review "Thermochemistry"

Pre-AP Chemistry
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Chapter 17 Review

- What would likely happen if you were to touch the flask in which an endothermic reaction were occurring?
- Standard conditions of temperature and pressure for a thermochemical equation are ____ and ____.
- What is the heat of solution?

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- Hess's law makes it possible to ____.
- If heat is released by a chemical system, an equal amount of heat will be ____.
- By what quantity must the heat capacity of an object be divided to obtain the specific heat of that material?

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- The symbol ____ stands for the ____.
- When energy is changed from one form to another, ____.
- What happens to the energy produced by burning gasoline in a car engine?
- How can the enthalpy change be determined for a reaction in an aqueous solution?

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- A process that absorbs heat is called a(n) ____ process.
- What does the symbol ΔH stand for?
- During a phase change, the temperature of a substance ____.
- The amount of heat needed to melt one mole of a solid at a constant temperature is called ____.

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- Using a table that lists standard heats of formation, you can calculate the change in enthalpy for a given chemical reaction. The change is equal to ____.
- A piece of metal is heated, then submerged in cool water. The temperature of the water ____ and the temperature of the metal ____.

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- The amount of heat released by the complete burning of 1 mole of a substance is the _____.
- The ΔH_{soln} is a value that is _____.
- In an exothermic reaction, the energy stored in the chemical bonds of the reactants is _____ than the energy stored in the bonds of the products.

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- The amount of heat involved in the synthesis of 1 mole of compound from its elements, with all substances in their standard states at 25 °C, is called _____.
- Which of the following substances has the highest specific heat: a) alcohol, or b) water?

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- On what principle does calorimetry depend?
- The specific heat capacity of graphite is 0.71 J/g °C. Calculate the energy required to raise the temperature of 450 g of graphite by 16 °C.

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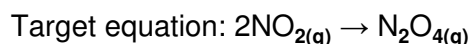
- Consider a 79 g chunk of ice ($\Delta H_{\text{fus}} = 6.0 \text{ kJ/mol}$) in a beaker immersed in a water bath. To produce just enough heat to melt the ice, how many moles of solid NaOH ($\Delta H_{\text{soln}} = -445.1 \text{ kJ/mol}$) must you dissolve in the water bath?

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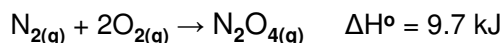
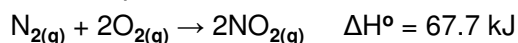
- A 25.0 g piece of copper wire is heated, and the temperature of the wire changes from 29.0 °C to 86.0 °C. The amount of heat absorbed is 343 cal. What is the specific heat of copper?

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- Use the information below to calculate ΔH° for the reaction.



Given equations:



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- How much heat is required to raise the temperature of 6.5×10^2 g of aluminum by $30\text{ }^\circ\text{C}$? (specific heat of aluminum = $0.21\text{ cal/g }^\circ\text{C}$)
- How many joules are there in 125 calories? ($1\text{ cal} = 4.184\text{ J}$)
- How much heat is required to melt 4.6 mol of NaCl ($\Delta H_{\text{fus}} = 30.2\text{ kJ/mol}$) at its melting point?

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- It takes 470 joules of energy to raise the temperature of 50.0 g of mercury by $90\text{ }^\circ\text{C}$. What is the specific heat of mercury?
- A substance releases 296 kJ of heat as 1.60 mol condense from a gas into a liquid. What is the molar heat of vaporization of the substance?

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- When 34.0 g of methanol (CH_3OH) is burned, 954 kJ of energy is produced. What is the heat of combustion (in kJ/mol) for methanol?

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- If you supply 36 kJ of heat, how many moles of ice at $0\text{ }^\circ\text{C}$ can be melted, heated to its boiling point, and completely boiled away?

Use the following information:

$$\Delta H_{\text{vap}} = 40.5\text{ kJ/mol}$$

$$\text{Specific heat}_{\text{water}} = 0.0753\text{ kJ/mol }^\circ\text{C}$$

$$\Delta H_{\text{fus}} = 6.0\text{ kJ/mol}$$

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- A certain substance with a molar mass of 43 g/mol has a heat of fusion of 28 cal/g. How many calories are needed to melt 5.2 kg of the substance?
- If 150 g of iron absorbs 2,000 cal of heat, what will be the change in temperature? (specific heat of iron = $0.11\text{ cal/g }^\circ\text{C}$)

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End of Chapter 17 Review