

12-4 Review and Reinforcement

Calorimetry

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

water	heat capacity	specific heat
heat	calorimetry	temperature
oxygen	calorimeter	carbohydrates

- The study of heat flow and heat measurement is called _____.
- The words calorimeter, calorimetry, and calorie are all derived from the Latin word *calor*, which means _____.
- The amount of heat needed to raise an object's temperature depends on its _____.
- Every substance has a _____, which tells you how much heat is necessary to raise the temperature of 1 gram of the substance by 1 Celsius degree.
- _____ has one of the highest specific heats of any common substance.
- A transfer of heat is detected by measuring a _____ change.
- A _____ is a well-insulated container used to measure temperature changes.
- On the average, _____ supply 17 kJ/g (4 Cal/g) of energy.
- Foods are reacted with _____ in a laboratory calorimeter to determine their energy values.

Use your knowledge from Section 12-4 to write the meaning of each of the following symbols.

- T_i _____
- T_f _____
- q_{rxn} _____
- q_{sur} _____
- m _____
- C _____

12-4 Review and Reinforcement (continued)

Answer the following question in the space provided.

16. Explain how a calorimeter is used to determine the quantity of heat transferred in a chemical reaction.

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

17. A metal that has a mass of 23.4 g has a heat capacity of 6.18 J/C°. What is the specific heat of the metal?

18. 15.3 g of NaNO₃ were dissolved in 100. g of water in a calorimeter. The temperature of the water dropped from 25.00°C to 21.56°C. Calculate ΔH for the solution process.

19. A 1.0-g sample of octane (C₈H₁₈) is burned in a calorimeter containing 1200 g of water. The temperature of the water rises from 25.00°C to 33.20°C. Calculate ΔH for this process.

20. How much heat is required to raise the temperature of 20.0 g of iron from 26°C to 72.30°C? The specific heat of iron is 0.447 J/g·C°.