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Next

Experiment 21 Report Sheet

Calorimetry

Date \_\_\_\_\_ Lab Sec. \_\_\_\_\_ Name \_\_\_\_\_ Desk No. \_\_\_\_\_

A. Specific Heat and the Molar Mass of a Metal

Unknown No. _____	Trial 1	Trial 2
1. Mass of metal (g)	24.200	27.214
2. Temperature of metal (boiling water) (°C)	100°C	100°C
3. Mass of calorimeter + water (g)	29.551	29.551
4. Mass of calorimeter (g)	9.557	9.557
5. Mass of water (g)	20.0	20.0
6. Temperature of water in calorimeter (°C)	21.2	21.2
7. Maximum temperature of metal and water from graph (°C)	27.9	28.1

8. Instructor's approval of graph \_\_\_\_\_

Calculations for Specific Heat and the Molar Mass of a Metal

1. Temperature change of water, $\Delta T$ (°C)	_____	_____
2. Heat gained by water (J)	_____	_____
3. Temperature change of metal, $\Delta T$ (°C)	_____	_____
4. Specific heat of metal ( $J/g^\circ C$ )	_____	_____
5. Average specific heat of metal ( $J/g^\circ C$ )	_____	_____
6. Estimated molar mass of metal (g/mol)	_____	_____

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Student Name \_\_\_\_\_  
 Section / Lab Group \_\_\_\_\_  
 Date \_\_\_\_\_

Objectives

The overall goal of this experiment was to determine the specific heat of a metal. In this experiment, a known mass of a metal is heated in boiling water and then placed in a calorimeter containing a known mass of water. The temperature of the water in the calorimeter is measured before and after the metal is added. The heat lost by the metal is equal to the heat gained by the water. The specific heat of the metal can be calculated using the mass of the metal, the change in temperature of the metal, the mass of the water, the change in temperature of the water, and the specific heat of water.

Introduction  
 In this experiment, we will determine the specific heat of a metal. The specific heat of a substance is the amount of heat energy required to raise the temperature of one gram of the substance by one degree Celsius.

Mass and Specific Heat	Value
Mass of Calorimeter	9.557 g
Mass of Water	20.0 g
Mass of Calorimeter + Water	29.551 g
Initial Temperature of Water	21.2 °C
Final Temperature of Water	27.9 °C
Temperature Change of Water	6.7 °C
Mass of Metal	24.200 g
Initial Temperature of Metal	100 °C
Final Temperature of Metal	27.9 °C
Temperature Change of Metal	72.1 °C

EXPERIMENT 21

Specific Heat

1. Objective  
 To be able to calculate the specific heat of a metal.

2. Theory  
 Calorimetric measurements involve the use of various temperature and energy units. In order to avoid errors and confusion in the interpretation of these data, their relationships should be well understood. Calorimetry is the science of measuring quantities of heat, as distinct from "temperature". It is an important field of applied physics which deals directly with measuring heat of reaction and heat capacities in fields ranging from nutritional analysis to explosive yield tests (Bridgman, 2005). The instruments used for such measurements are known as calorimeters. A calorimeter can be a simple container with good insulation which prevents heat exchange with the environment. There are different types of calorimeters that are widely used around the world: bomb calorimeter, (i) tea calorimeter, (ii) coffee calorimeter, (iii) solution calorimeter, and (iv) bomb calorimeter. As shown in Figure 1 below, four essential parts are required in any bomb calorimeter: (i) bomb or vessel in which the combustion reaction is carried out, (ii) jacket or container for holding the bomb, a measured quantity of water, together with a stirring mechanism, (iii) an insulating jacket to protect the bomb from unwanted heat losses during the combustion process, and (iv) a thermometer or other sensor for measuring temperature changes within the jacket (Parr Instrument Company, 2005).

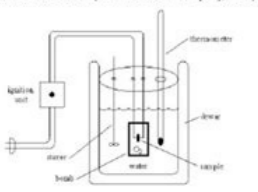


Figure 1. Bomb Calorimeter (Parr, 2005)

According to the first law of thermodynamics, a change in internal energy depends on heat transfer between the system and the surroundings (qv) and work done by the system (w). (Bridgman, 2005)  
 Assuming that both heat and volume change in a process occur through work but not through heat, then  
 If we assume that only pressure (P) and volume (V) work is done and the volume is constant (i.e.,  $\Delta V = 0$ ), we



11,942. Conclusion In conclusion, the results of the average heat capacity for all these procedures should reflect the endothermic and exothermic properties of the heat absorbed and released in these reactions. The average heat of a specific metal was equal to  $J / G \Delta t \text{ } ^\circ C$ . The average of  $H \Delta z$  was 2487 J J KJ), and the average of  $H \Delta t$  was 12098 J / mol Sal. All were found  $^\circ$ , using heat capacity equations, however, I am sure that the percentage of errors in my calculations is extremely high. However, these are the conclusions I have drawn from the results. CHEM 317 Inorganic Chemistry Lab credit: 3 Hours. Emphasizes modern techniques for the synthesis, purification, and characterization of inorganic and organometallic compounds. There are three components to the course: lectures on laboratory methodology and reporting, laboratory experiments, and report writing. Dec 20, 2021 · The Engineering Laboratory promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology for engineered systems in ways that enhance economic security and improve quality of life. Oct 11, 2021 · The continual advance in forensic technologies translates to a corresponding high demand for lab analysts. Career options exist with the federal, state and local law enforcement agencies, forensic laboratories, medical examiner offices, ... Connect Virtual Labs is a fully online lab solution that can be used as an online lab replacement, preparation, supplement or make-up lab to bridge the gap between lab and lecture. These simulations help a student learn the practical and conceptual skills needed, then check for understanding and provide feedback. CHM-231L: Organic Chemistry I Lab Total Credits: 1 Course Description The laboratory section of CHM-231 reinforces principles learned in the lecture course through various techniques that organic chemists use to synthesize compounds. Nov 22, 2021 · The Chemistry program features a wide variety of class sizes, types, and delivery methods. Most general chemistry courses consist of 3 hours of lecture per week (class sizes of ca. 360) presented by PhD level faculty, in addition to 1 hour of recitation and 3 hours of laboratory (class sizes of ca. 22 students) supervised by a graduate student teaching assistant. Jun 03, 2021 · Program Purpose. The purpose of the undergraduate chemistry program at the University of Utah is to provide the key knowledge base and laboratory resources to prepare students for careers as professionals in the field of chemistry, for graduate study in chemistry, biological chemistry and related fields, and for professional school including medical, dental, ... Jan 16, 2021 · Generic Lab Documents Descriptive Lab Report Guide Descriptive Lab Report Rubric Experimental Lab Report Guide Experimental Lab... Announcements. Welcome back, Educators! ... NUCLEAR CHEMISTRY Lab: Half-Life: Student Document: Lab: Half-Life Model- Virtual Lab... Lab: Calorimetry and Specific Heat: Student Document: Lab: Enthalpy: Student ... CHM-231L: Organic Chemistry I Lab Total Credits: 1 Course Description The laboratory section of CHM-231 reinforces principles learned in the lecture course through various techniques that organic chemists use to synthesize compounds. Calorimetry lab answers Lab calorimetry and specific heat lab report Wednesday, 5. 3 Answer questions 11-13, 18-20 9/8 1. 38 0. WordDisk helps you to build your English vocabulary while you read. If so it is easy to remove the Pre-Lab section from the lab manual. A discussion of chemical hot and cold packs can really warm up a classroom lesson on thermochemistry. In this hands-on activity, students use a coffee cup calorimeter to measure the heat of solution of a chemical salt using 3 different ... Sep 08, 2021 · Gizmo answer key for free books calorimetry lab gizmo answer key to read gizmo answer key calorimetry lab pdfsdocuments2com. Gizmo Density Lab Answers If you ally habit such a referred gizmo density lab answers books that will give you worth acquire the extremely best seller from us currently from several preferred authors.

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