

Name: Ahmed Faizan Date: 12 May Period:

Specific Heat and Heat Capacity Worksheet

DIRECTIONS: Use $q = (m)(C_p)(\Delta T)$ to solve the following problems. Show all work and units.

Ex: How many joules of heat are needed to raise the temperature of 10.0 g of aluminum from 22°C to 55°C, if the specific heat of aluminum is 0.90 J/g°C?

$$\begin{aligned} q &= ? & \Delta t &= 55 - 22 = 33^\circ\text{C} & q &= m s \Delta t \\ m &= 10\text{g} & s &= 0.9 \text{ J/g}^\circ\text{C} & &= 10 \times 0.9 \times 33 \\ & & & & &= \underline{297 \text{ J}} \end{aligned}$$

1. The temperature of 335 g of water changed from 24.5°C to 26.4°C. How much heat did this sample absorb? C for water = 4.18 J/g°C

$$\begin{aligned} \Delta t &= 26.4 - 24.5 = 2 & q &= m s \Delta t \\ s &= 4.18 \text{ J/g}^\circ\text{C} & &= 335 \times 4.18 \times 2 \\ m &= 335\text{g} & &= \underline{2800.6 \text{ J}} \end{aligned}$$

2. How much heat in kilojoules has to be removed from 225g of water to lower its temperature from 25.0°C to 10.0°C?

$$\begin{aligned} \Delta t &= 25 - 10 = 15 & q &= m s \Delta t \\ m &= 225\text{g} & &= 225 \times 4.18 \times 15 \\ s &= 4.18 \text{ J/g}^\circ\text{C} & &= \underline{14107.5 \text{ J}} \\ 1\text{J} &= 1 \times 10^{-3} \text{ KJ} & &\therefore \underline{14.1075 \text{ KJ}} \end{aligned}$$

3. To bring 1.0kg of water from 25°C to 99°C takes how much heat input?

$$\begin{aligned} m &= 1\text{kg} = 1000\text{g} & q &= 1000 \times 4.18 \times 74 \\ \Delta t &= 99 - 25 = 74 & & \\ s &= 4.18 \text{ J/g}^\circ\text{C} & q &= \underline{309320 \text{ J}} \end{aligned}$$

An insulated cup contains 75.0g of water at 24.00°C. A 26.00g sample of metal at 82.25°C is added. The final temperature of the water and metal is 28.34°C. What is the specific heat of the metal?

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$$\begin{aligned} (q_{\text{water}} &= -q_{\text{metal}}) & (C = m s) &\rightarrow s = \frac{C}{m} \\ q_{\text{water}} &= 75 \times 4.18 \times (28.34 - 24) & q &= m s \Delta t \\ &= 1252 & 1252 &= 26 \times s \times (82.25 - 28.34) \\ & & &1252 = 26 \times 53.91 \times s \\ & & &s = \underline{0.893 \text{ J/g}^\circ\text{C}} \end{aligned}$$

5. A calorimeter has a heat capacity of 1265 J/°C. A reaction causes the temperature of the calorimeter to change from 22.34°C to 25.12°C. How many joules of heat were released in this process?

$$\begin{aligned} C &= 1265 \text{ J/}^\circ\text{C} \\ \Delta t &= 25.12 - 22.34 = 2.78 \\ q &= ? \\ q &= C \Delta t \\ &= 1265 \times 2.78 \\ &= \underline{3516.7 \text{ J}} \end{aligned}$$

Answers For Specific Heat Cpo Science

Patrick Knupp, Kambiz Salari



Answers For Specific Heat Cpo Science:

Nuclear Science Abstracts ,1975-05 **Report Availability Notice, Summer 1974** United States. Office of Naval Research. Ocean Science and Technology Division,1974 Verification of Computer Codes in Computational Science and Engineering Patrick Knupp,Kambiz Salari,2002-10-29 How can one be assured that computer codes that solve differential equations are correct Standard practice using benchmark testing no longer provides full coverage because today s production codes solve more complex equations using more powerful algorithms By verifying the order of accuracy of the numerical algorithm implemented in the code one can detect most any coding mistake that would prevent correct solutions from being computed Verification of Computer Codes in Computational Science and Engineering sets forth a powerful alternative called OVMSP Order Verification via the Manufactured Solution Procedure This procedure has two primary components using the Method of Manufactured Exact Solutions to create analytic solutions to the fully general differential equations solved by the code and using grid convergence studies to confirm the order of accuracy The authors present a step by step procedural guide to OVMSP implementation and demonstrate its effectiveness Properly implemented OVMSP offers an exciting opportunity to identify virtually all coding bugs that prevent correct solution of the governing partial differential equations Verification of Computer Codes in Computational Science and Engineering shows you how this can be done The treatment is clear concise and suitable both for developers of production quality simulation software and as a reference for computational science and engineering professionals Report Availability Notice United States. Office of Naval Research. Ocean Science and Technology Division,1974 **Boundary and Mixed Lubrication: Science and Applications** D. Dowson,2002-07-10 Session headings Keynote address and invited paper Boundary lubrication 1 Boundary lubrication 2 Mixed lubrication Lubricants 1 Lubricants 2 Nano boundary lubrication and molecular dynamics Coatings Dry wear Lubricated wear Bio tribology total replacement hip joints Elastohydrodynamic lubrication Friction 1 Bearings Friction 2 Mechanical systems Canadian Journal of Chemistry ,1975 Advances in Chemical Propulsion Gabriel D. Roy,2001-10-25 Written by the scientists who performed the research this book reports on the progress achieved by the outstanding team of researchers participating in the ONR Propulsion Program It covers all aspects of the combustion process from chemical synthesis reaction pathways of the fuel and combustor performance to the reduction of emissions thrust vectoring and control The chapter authors discuss the relevant issues describe their approach and results and explain how the findings can be extended to practical applications Richly illustrated and carefully edited for clarity uniformity and readability this book offers a comprehensive survey of the field from pre to post combustion Proceedings of the Oklahoma Academy of Science Oklahoma Academy of Science,1961 Vols 1 49 are Proceedings of the 1st 57th annual meetings

Numerical Methods in Laminar and Turbulent Flow Cedric Taylor,B. A. Schrefler,1981 *Bulletin of the Atomic Scientists* ,1976-03 The Bulletin of the Atomic Scientists is the premier public resource on scientific and technological

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