Name: CALVIN
Date:
Hour:

AP Chem Ch.6 Practice

1) **Label each letter AND give appropriate units for each.**

$q = (m)(\Delta T)(C_p)$

heat/NRG (J) — mass (g) — change in temp. (°C) — specific heat (J/g·°C)

2) **Define *specific heat*:**

NRG to raise 1 g of something by 1 °C

3) **Give three specific examples where you have observed water to have a high specific heat.**

Read.

4) **If 4,555J of heat are added to a sample of Iron to increase it's temperature by 5.5°C, find the mass of the sample.**

$q = 4,555\,J$
$m = ?$
$\Delta T = 5.5\,^\circ C$
$C_p = 0.450\,J/g\cdot{}^\circ C$

$q = m \cdot \Delta T \cdot C_p$

$m = \frac{q}{\Delta T \cdot C_p} = \frac{(4,555\,J)}{(5.5\,^\circ C)(0.450\,J/g\cdot{}^\circ C)} = 1,800\,g$

$1.8 \times 10^3\,g$

5) **How much heat is given off by an 18.2g sample of Tin as it cools from 47.7°C to 23.2°C?**

$q = ?$
$m = 18.2\,g$
$\Delta T = -24.5\,^\circ C$
$C_p = 0.21\,J/g\cdot{}^\circ C$

$q = m \cdot \Delta T \cdot C_p$

$q = (18.2\,g)(-24.5\,^\circ C)(0.21\,J/g\cdot{}^\circ C) = -94\,J$

6) **An unknown sample of metal has it's temperature raised by 24.5°C when 2.20kJ of heat are applied to a 100.00g sample. Find the specific heat of this sample AND *identify the substance.***

$\Delta T = 24.5\,^\circ C$
$q = 2,200\,J$
$m = 100.00\,g$
$C_p = ?$

$q = m \cdot \Delta T \cdot C_p$

$C_p = \frac{q}{m \cdot \Delta T} = \frac{(2,200\,J)}{(100.00\,g)(24.5\,^\circ C)} = 0.898\,J/g\cdot{}^\circ C$

Al

7) **What mass of liquid water can be raised from 70.0 degrees Celsius to it's boiling point with the addition of 12.0kJ of heat?**

$m = ?$
$\Delta T = 30.0°C$
$q = 12,000 J$
$C_p = 4.186 J/g \cdot °C$

$q = m \cdot \Delta T \cdot C_p$

$m = \frac{q}{\Delta T \cdot C_p} = \frac{(12,000 J)}{(30.0°C)(4.186 J/g \cdot °C)} = 95.6 g$

8) **333 Joules of heat are added to 125 g of Aluminum that begins at 25.0 degrees Celsius. Find the final temperature.**

$q = 333 J$
$m = 125 g$
$\Delta T = ?$
$C_p = 0.898 J/g \cdot °C$

$q = m \cdot \Delta T \cdot C_p$

$\Delta T = \frac{q}{m \cdot C_p} = \frac{(333 J)}{(125 g)(0.898 J/g \cdot °C)} = 2.97°C$

28.0°C

9) **Differentiate between <u>heat</u> and <u>temperature</u>.**

total KE

avg KE

0.386 0.190 4.186

10) **Suppose you had 100.0g each of copper, sand and water. If you placed them in your oven for 15 minutes at 425 degress Celsius, rank them order of HIGHEST to LOWEST temperature upon removal.**

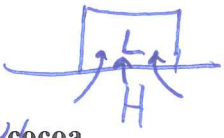
SAND, Copper, Water

11) **Give TWO examples YOU have seen where things "seem" to have different temperatures even though they exist in the same environment.**

- Desk, metal chair
- Beach = sand/water

12) **Draw a picture of:**

a. **The heat transfer when you hold an ice cube**



b. **The heat transfer when you hold a mug of hot cocoa**

13) Explain why it is INCORRECT to say, "heat always rises."

Rises.

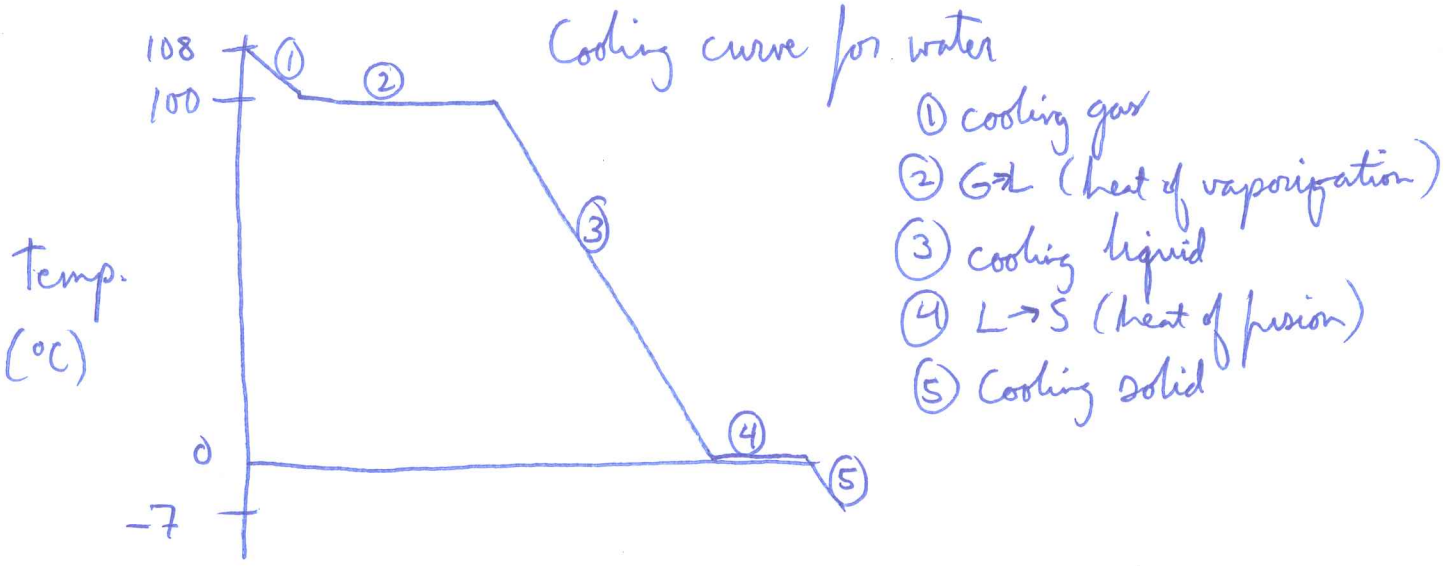
14) What would be a more accurate saying.

Hot air rises

15) Give TWO reasons why the sand and water temperature at the beach can be drastically different on the same day.

Different specific heats. SAND only heats top layer

16) Draw a cooling curve for water as it's temperature drops from 108 degrees Celsius to -7 degrees Celsius.



17) A 125.00g of Aluminum is at 192.0°C. After it is placed into 300.0g of water at 35.0°C. determine the final temperature of the system.