**Chemistry**

**Review for Unit 7 Test**

**PART 1: Mass, moles, and the elements**

1. How many moles are in 50g of iron oxide (Fe2O3)?

1. A serving of Junior Mints contains 35g of sugar (C12H24O12). How many moles of sugar is this?

**PART 2: THERMAL ENERGY**

1. The thermal energy for an object is determined by what three things?
2. Finishing your soda, you stand at a party holding your insulated foam cup that has nothing in it but 150g of ice at 0°C. How much more heat must be gained to raise the temperature of the melted ice to room temperature of 23.0°C? (cwater = 4.18 J/kg°C)



1. Nova, whose mass is 50.0kg, stays out skiing for too long and her body temperature drops by 2.5°C. What is the amount of heat loss from Nova’s body? (chuman body = 3470 J/kg°C)
2. One beaker contains 14g of water at 22°C and a second beaker contains 7.65 g of water at 96°C. What is the final temperature of the water after the beakers are mixed? (Hint: Look at Lab #11)
3. Frank whose mass is 60.0 kg, places his head in a pile of snow and his temperature drops by 4.00°C. What is the amount of heat loss from Frank’s body? (chuman body = 3470 J/kg°C)
4. One beaker contains 220 g of water at 14°C and a second beaker contains 83 g of water at 82°C. What is the final temperature of the water after the beakers are mixed? (Hint: Look at Lab #11)
5. Suppose you add 100 joules of heat energy to 50 grams of water. How much will the temperature of the water increase (Specific heat of water = 4.18J/g°C?
6. When substances mix at different temperatures, what happens?
7. If the system includes both the cold and hot water, compare the energy of the system before mixing to the energy after mixing. You may ignore any energy going to air or friction.

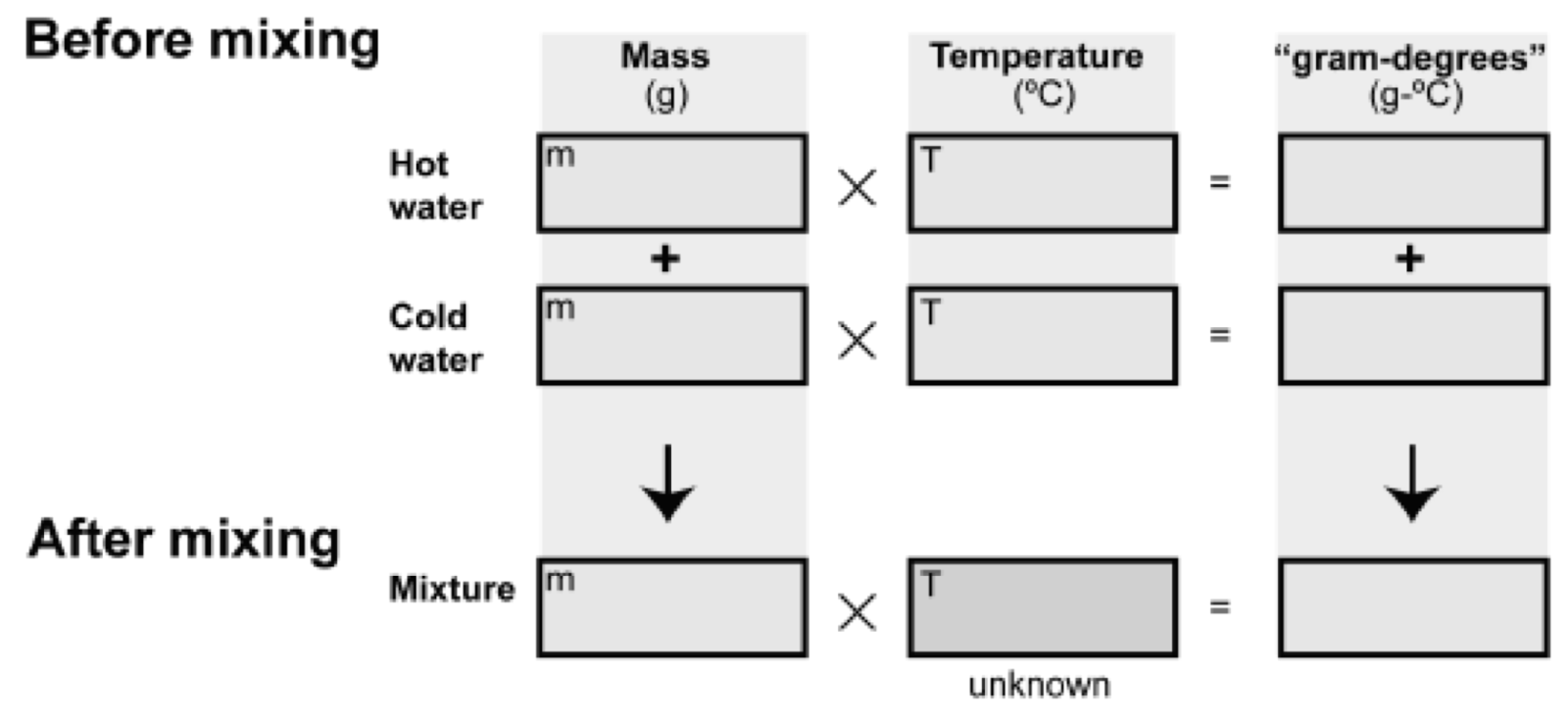
(Hint: Conservation of Energy!!)

1. What is thermal equilibrium? How does a substance reach thermal equilibrium?

|  |  |
| --- | --- |
| **Metal** | **Specific Heat (J/gCo)** |
| Aluminum | 0.899 |
| Copper | 0.385 |
| Lead | 0.129 |
| Tin | 0.222 |
| Zinc | 0.385 |

For the following problems use the table above as needed:

1. Calculate the amount of energy that 15 grams of aluminum will absorb if it heats up from 20oC to 75oC
2. Calculate the amount of energy that 3 grams of lead will absorb if it heats up from 25oC to 123oC.
3. Determine the unknown metal from the list at the top of the page if 15 grams of the metal changes temperature from 22oC to 75oC and it absorbs 160 J of energy.
4. What would the final temperature be if 10g of zinc starts at 15oC and absorbs 1500 J of energy?
5. Define specific heat:
6. How much energy would water absorb if 14 g of CaCl2 was placed in 25g of H2O and the temperature increased from 20oC to 42oC?
7. How many joules per gram of solid would be absorbed by the water in question #18?



1. A group ran a mixture lab with one beaker containing 135g of water at 75°C and a second beaker containing 225g of water at 15°C. Using the flowchart below, determine the final temperature of the water that the group ***should*** have gotten after the beakers are mixed.
2. Draw the energy graph of an exothermic reaction.



1. Draw the energy graph of an endothermic reaction.
2. An ice pack used by athletic trainers becomes cold when activated. Is this the result of an exothermic or an endothermic reaction? Explain.
3. Does an exothermic reaction feel cold or hot? Explain.
4. Does an endothermic reaction feel cold or hot? Explain.



**Unit 7- Lab Practical Review**

Directions: Collect 10 grams of solid ammonium chloride and 10 grams of Water. Be sure to complete and record one trial of this in the data table below. SHOW ALL WORK!!

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Mass of Ammonium Chloride(g) | Mass of water (g) | Mass of solution (g) | Temperature initial | Temperature Final | **T**emperature |
|  |  |  |  |  |  |

1. How many moles of water, H2O, were used in this reaction?
2. How many moles of solid Ammonium Chloride, NH4Cl, were used in this reaction?
3. The specific heat of water is 4.18 J/goC. Calculate the amount of energy released during the reaction.
4. Total energy in joules =
5. Total energy in joules/mole of ammonium chloride=
6. Was the reaction that you saw an endothermic or exothermic reaction? Explain.
7. Was the reaction that you saw a chemical or physical change? Explain.