**SI WORKSHEET 13**

1. What is the molar heat capacity of 50 ml of ethanol (C2H5OH) if 90O J are released from the reaction when the temperature changes from 20oC to 30oC? (density= 0.789g/ml)

Q=mcmΔT🡪900J= ()(X)(30-20)🡪900J=8.58X🡪X105J/goC

1. A 20 gram sample of an element/compound heats up from 25oC-50oC and gives off 192.5J of energy. What compound is this? Q=mcΔT🡪192.5J=(20)(X)(50-25)🡪

192.5J=500X🡪X=.385 J/g\*C. Every element and compound has a specific heat constant that is specific to that element or compound. This .385 value refers to Copper. \*Have to use book or google to find a list of specific heat constants\*

1. 75 gram of water at 23oC reacts with 100 grams of gold at 200oC. What is the final temperature of both reactants? (c of gold=.129 J/g\*C)

-qsystem=qsurroundings (This is the way I picked the system and surroundings however you can pick either the gold or water as the system or surroundings and the math will be the same.)🡪

-qgold=qwater🡪-(100g)(.129)(X-200)=(75)(4.184)(X-23)🡪-12.9X +2580= 313.8X -7217\*solve for X\*

326.7X=9797🡪X30oC

1. When 100 g of silver at 200oC comes into contact with a certain amount of water at 23oC the final temperature is 150oC. How much water was present? (c of Ag= .233j/g\*C). Similar to #3

- qsystem=qsurroundings🡪 -(100)(.233)(150-200)=(X)(4.184)(150-23)🡪1165=531.4X🡪X=2.19g Water

1. 100 ml of NaOH and HCl are mixed in a calorimeter with a heat capacity of 849 J/\*C. If the temperature of the solution rose from 23oC to 40oC
   1. How much energy was given off to the surroundings? Assume density of solution is 1.00g/ml qsolution=-(qreaction + qcalorimeter) 🡪 qsolution=-()(4.184)(40-23) + (849\*17)🡪 -28658 J given off
   2. What is ⍙H and the thermochemical expression for this reaction? QSOLUTION=-qreaction🡪qRXN= - ()(4.184)(40-23)=-14225J🡪-14.225 kJ=⍙H NaOH+ HCl🡪 H2O + NaCl ⍙H= -14.225 kJ
   3. Endothermic or exothermic? Exothermic
2. H2O(g)🡪 H2O(s) ⍙H= ON NEXT SI SHEET ALONG WIH #7
   1. Is this process endo or exothermic?
   2. How much energy is released/absorbed if 50 g of water is originally at 130oC and cools at -20oC (⍙Hfusion = 333 J/g and ⍙Hvaporation =2260 J/g)
3. Food for thought: If an element/compound has a low specific heat capacity, what does that say about that compound?