Chemistry NAME: ______________________________

Chapter 17 Reference Sheet

Conversions between Joules and calories

- 1 J = 0.2390 calories 1 calorie = 4.184 J

Specific Heat

- $C = \frac{q}{m \Delta T}$ Units for C are J/(g °C) or cal / (g °C)
  - q = heat in Joules or calories
  - m = mass in grams
  - ΔT = final – initial temperature (°C)

$m = \frac{q}{C \Delta T}$ $\Delta T = \frac{q}{mC}$

$q = C\,m\,\Delta T$

Enthalpy Change

- $q = \Delta H$
- $q_{surr} = m \times C \times \Delta T$
- $q_{sys} = \Delta H = -\,q_{surr} = -\,m \times C \times \Delta T$
- $\Delta H = -m \times C \times \Delta T$

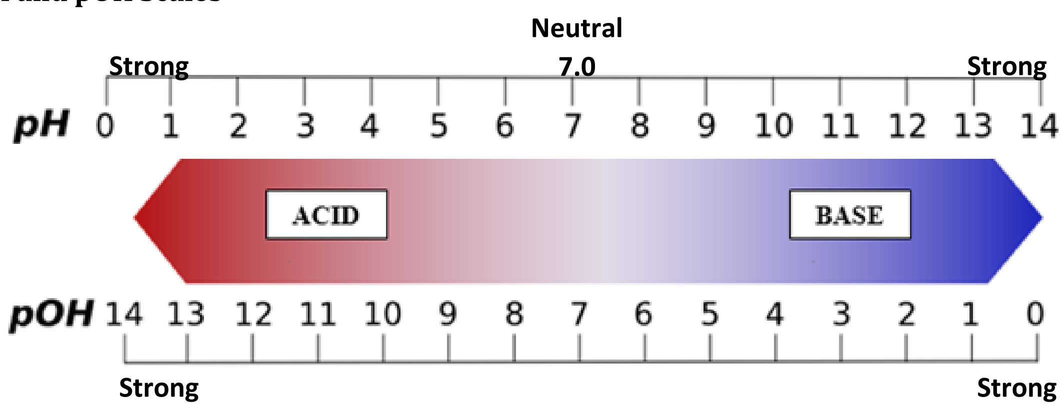
  - q = heat; J or calories
  - ΔH = enthalpy; J or calories
  - m = mass of the water; (g)
  - C = specific heat of water; J/(g °C) or cal / (g °C)
  - ΔT = final – initial temperature; (°C)

Chapter 19 Reference Sheet

Comparing Definitions of Acids and Bases

Type	Acid	Base
Arrhenius	H+ producer	OH- producer
Brønsted-Lowry	H+ donor	H+ acceptor
Lewis	Electron-pair acceptor	Electron-pair donor

pH and pOH Scales



Chemistry NAME: ___________________________

Calculations with pH and pOH

- ***Type 1:***
  - To find pOH **$pOH = 14 - pH$**
  - To find pH **$pH = 14 - pOH$**
    - *pH and pOH do not have a label*
    - Use addition and subtraction rules for Significant Digits

- ***Type 2:***
  - To find pH using hydronium concentration **$pH = -\log [H_3O]^+$**
  - To find pOH using hydroxide concentration **$pOH = -\log [OH]^-$**
    - **Don't forget the negative sign!**
    - Use the EXP key for the x $10^{\#}$ portion
    - *pH and pOH do not have a label*
    - Use multiplication and division rules for Significant Digits

- ***Type 3:***
  - To find hydronium concentration using pH **$[H_3O]^+ = \text{antilog} [- pH]$**
  - To find the hydroxide concentration using pOH **$[OH]^- = \text{antilog} [- pOH]$**
    - **Don't forget the negative sign when plugging it in to the calculator.** Antilog = 10^x or "shift" "LOG"
    - $[H_3O]^+$ *and* $[OH]^-$ *are labeled with "M" for Molarity / concentration*
    - Use multiplication and division rules for Significant Digits

- ***Type 4:***
  - To find the hydroxide concentration using the hydronium **$[OH]^- = \dfrac{1 \times 10^{-14}\ M}{[H_3O]^+}$**
  - To find the hydronium concentration using the hydroxide **$[H_3O]^+ = \dfrac{1 \times 10^{-14}\ M}{[OH]^-}$**
    - 1×10^{-14} M is a constant and won't affect Significant Digits
    - Use the EXP key for the x $10^{\#}$ portion
    - $[H_3O]^+$ *and* $[OH]^-$ *are labeled with "M" for Molarity / concentration*
    - Use multiplication and division rules for Significant Digits