**Name: Period: Seat#:**

**Worksheet #7**

**Directions:**

* Show your work on binder paper!
* Some answers are provided at the end of the problem. They are underlined.

1. **strong acid solution** – 0.00125M HNO3
   1. determine [H+]
   2. calculate pH *2.903*
2. **strong base solution** – 0.00125M KOH
   1. determine [OH-]
   2. calculate pOH
   3. calculate pH *11.097*
3. **weak acid solution** – 0.00125M HOCl Ka = 3.5 x 10-8
   1. determine [H+] using ICE box
   2. calculate pH *5.18*
4. **weak base solution** – 0.00125M NH3 Kb = 1.8 x 10-5
   1. determine [OH-] using ICE box
   2. calculate pOH
   3. calculate pH *10.15*

**For the following problems, assume the 5% rule for all (even if it may not apply) just so you can get some extra practice with the 5% rule.**

1. Find the pH of 0.065 M formic acid. The acid dissociation constant (Ka) for formic acid is 1.8 x 10-4. *2.47*
2. Find the pH of a 0.325 M acetic acid solution. Ka = 1.8 x 10-5. *2.62*
3. Find the pH of a solution that contains 0.0034 M lactic acid (Ka =1.4 x 10-4) and 0.056 M propionic acid   
   (Ka = 1.4 x 10-5). *2.80*
4. What is the pH of a 0.00056 M butyric acid solution. Ka = 1.5 x 10-5 . *4.04*

**Challenge Problems (optional):**

* Complete these and come show me – if you get it correct I’ll give you some tickets!

1. **Diprotic acid solution** – Calculate the pH of 0.00125M H2CO3 Ka1 = 4.2 x 10-7 Ka2 = 4.8 x 10-11
   1. First dissociation – assume all molecules lose one [H+]
      1. Find [H+] with simple pH calculation
   2. Second dissociation – assume all molecules lose the second [H+]
      1. Find [H+] using ICE box
   3. Add [H+] from first and second dissociation
   4. Calculate pH from the sum of all [H+]
2. **Mixture of acid and base** – Calculate the pH of 20.0 mL of 0.00125M HNO3 + 30.0 mL of 0.00125M KOH
   1. calculate moles of H+ and OH-
   2. determine moles of excess H+ or OH-,
   3. determine total volume
   4. calculate [H+] or [OH-]
   5. calculate pH