**Quiz 4**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Answer the following questions about the titration curve experiment (5 points):
   1. What are you using as your titrant in this week’s experiment? Sodium hydroxide
   2. How many weak acids are you titrating? Three
   3. What is the identity of the weak acid(s) you are titrating? Acetic acid, phosphoric acid and an unknown acid
2. A certain weak acid, HA, with a Ka = 5.61 x 10-6, is titrated with NaOH (10 points).
   1. A solution is made by mixing 9.00 mmol of HA with 3.00 mmol of the strong base. What is the resulting pH?

Stoichiometry First

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | HA (aq) | + | OH- (aq) |  | A- (aq) | + | H2O (l) |
| I | 9.00 mmol |  | 3.00 mmol |  | 0 M |  | n/a |
| C | -3.00 mmol |  | -3.00 mmol |  | +3.00 mmol |  | n/a |
| E | 6.00 mmol |  | 0.00 mol |  | 3.00 mmol |  | n/a |

Equilibrium Second

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | HA (aq) | + | H2O (l) |  | A- (aq) | + | H3O+ (aq) |
| I | 6.00 mmol |  | n/a |  | 3.00 mmol |  | ~10-7 M |
| C | -x |  |  |  | +x |  | +x |
| E |  |  |  |  |  |  |  |

or

* 1. More strong base is added until the equivalence point is reached. What is the pH of this solution at the equivalence point if the total volume is 46.0 mL?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | A- (aq) | + | H2O (l) |  | HA (aq) | + | OH- (aq) |
| I |  |  |  |  | 0 M |  | 10-7 M |
| C | -x |  |  |  | +x |  | +x |
| E | 0.196 M – x =  0.196 M – 5.91 x 10-5 M ≈0.196 M |  |  |  | x = 5.91 x 10-5 M |  | x = 5.91 x 10-5 M |