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**POST-LAB REPORT #6**

**ACIDS, BASES, SALTS, AND BUFFER SOLUTIONS**

*1. Show calculation of [] and [] from the pH of 0.010 M HCl you measured in part A. Be sure to include units, and to report the correct number of significant figures.*

Measure pH = **2.39**

Calculated [] = = = 0.00407380 M = **0.0041 M**

Calculated [] = = = 2.45471 x M = **2.5 x M**

*2. Complete and balance the hydrolysis equations for the reactions listed (hints: Al (aq) is more accurately described as Al consult section 14.4 in lecture textbook):*

1. + +
2. + ⇌ +
3. + ⇌ +
4. + ⇌ +
5. Al + ⇌ Al + HCl

*3. Show calculation of the calculated pH of your phosphate buffer (part D). Be sure to include units, and to report the correct number of significant figures.*

Desire pH = **7.00 – 9.00**

Acid chosen ( = 6.2 x )

Base chosen

Volume of acid solution = Volume of base solution = **10.00 mL**

Concentration of acid solution = Concentration of base solution = **0.200 M**

Calculated pH of buffer = p + log = – log(6.2 x ) + log = 7.20761 = **7.21**

*4. Are aqueous solutions of sodium chloride acidic, basic, or neutral? Explain.*

Aqueous solutions of sodium chloride are neutral because when NaCI (s) dissolves, all that occurs is that (l) surrounds the and ions as has no charge and there is no additional or ions added. Therefore, the solution is neutral.

*5. In part D, you prepared a phosphate buffer using two solutions. Why are two solutions required?*

A phosphate buffer with a specific pH is composed of 2 solutions containing different forms of phosphate. An acid and base are mixed together to create a buffer which works to maintain pH. By adjusting the amount of each, a specific pH can be achieved.

*6. Define the term “buffer capacity”. Which buffer solution from part C had higher capacity, A or B? The concentrations of acid and base in buffer B are twice the concentrations of buffer A (buffer B is twice as strong as buffer A). Determine if the ratio of the volume of titrant required to raise the pH of each buffer 1 unit () is directly related to the ratio of the buffer concentrations ().*

“Buffer capacity” is the ability to resist a change in pH of a solution containing a buffer.

**Solution B** has a higher buffer capacity since more volume of HCl was needed in order to change the pH by 1 unit.

Buffer A: = – = 25.15 mL – 17.15 mL = 8.00 mL

Buffer B: = – = 40.52 mL – 25.15 mL = 15.37 mL

= = The ratio is about the same 2:1 ratio regarding concentrations and volumes.