Chemistry 106B L.
5 April 1955

1 20
2 20
3 20
4 20
5 17

97

Name Toole, Jr.
Last First

Laboratory Instructor Mr. Deck (?)

I. 0.613 g. of an acid required the addition of 11.70 ml. of 0.382 N NaOH to neutralize the acid completely. What is the equivalent weight of the acid?

.613

.382 × 11.70 = 4.5

136.2

$\frac{.613}{4.5} = \frac{x}{1000}$

4.5x = 613

x =

II. a) Define, in words, what you mean by normality.

Normality means no. equivalent wts per liter of solution.

b) Give a simple work equation defining normality.

Normality = $\frac{\text{no. equivalent wts of solid or liquid}}{\text{no. liters of dissolver } (H_2O)}$

c) How many equivalents, and how many grams of NaOH, are there in 200 ml. of 0.300 N NaOH?

Na 23
O 16
H 1
40

$\frac{200}{x} = \frac{1000}{12}$

1000x = 2400

x = 2.4

2.4 g
.06 equiv

III. List the following solutions in order of increasing pH. (Highest H^+ concentration on top). Indicate the order.
1F Na_2CO_3, 1F $NH_4C_2H_3O_2$, 1F NaOH, 1F $(NH_4)_2SO_4$, 1F HCl

1. HCl
2. $(NH_4)_2SO_4$
3. $NH_4C_2H_3O_2$
4. Na_2CO_3
5. NaOH

Highest H^+ conc.
↓
Lowest H^+ conc.

IV. The OH^- concentration of 0.01F ammonium hydroxide, NH_4OH, is 4.2×10^{-4} M. Write the equilibrium equation for its ionization, the equilibrium constant expression, and solve for the value of K.

$NH_4OH \rightleftharpoons NH_4^+ + OH^-$

$K = \frac{(NH_4)(OH)}{NH_4OH}$

$K = \frac{(.00042)(.00042)}{.01} = \frac{.0000001764}{.01} = .00001764$

20

$K = 17.6 \times 10^{-6}$

V. Write balanced equations for the hydrolysis of NH_4Cl, $NaC_2H_3O_2$, and Na_2CO_3.

$2NH_4Cl + 2H_2O \rightarrow 2NH_4OH + H_2 + Cl_2$

$NaC_2H_3O_2 + H_2O \rightarrow HC_2H_3O_2 + Na + OH$

not balanced $NaCO_3 + H_2O \rightarrow H_2CO_3 + Na + OH$