Name: CALVIN

Date:

Hour:

30

AP Chemistry Ch.15 Quiz

1) Calculate the $[H^+]$ in a solution that is 0.16 *M* in NaF and 0.25 *M* in HF. ($K_a = 7.2 \times 10^{-4}$)

A) 7.2×10^{-4} *M*
B) 1.6 *M*
C) 1.1×10^{-3} *M*
D) 0.20 *M*
E) 4.6×10^{-4} *M*

$HF \rightleftharpoons H^+ + F^-$

	HF	H^+	F^-
I	.25	0	.16
C	$-x$	$+x$	$+x$
E	$.25-x$	x	$.16+x$

$7.2\times10^{-4} = \frac{(x)(.16)}{(.25)}$ $x = 0.011 = [H^+]$

2) A weak acid, HF, is in solution with dissolved sodium fluoride, NaF. If HCl is added, which ion will react with the extra hydrogen ions from the HCl to keep the pH from changing?

A) OH^-
B) Na^+
C) F^-
D) Na^-
E) none of these

3) The pH at the equivalence point of the titration of a strong acid with a strong base is:

A) 3.9
B) 4.5
C) 7.0
D) 8.2
E) none of these

4) weak acid solution – determine [H+] using ICE table, calculate pH
Calculate the pH of 0.00125M HOCl $K_a = 3.5 \times 10^{-8}$

$HOCl \rightleftharpoons H^+ + OCl^-$

	HOCl	H^+	OCl^-
I	.00125	0	0
C	-x	+x	+x
E	.00125-x	x	x

$\frac{x^2}{.00125} = 3.5 \times 10^{-8}$

$x = 6.61 \times 10^{-6}$

$x > 5\%$

5) What is the pH of a 1.0 M solution of NaOCl? For HOCl, $K_a = 3.1 \times 10^{-8}$.

a) 10.75 d) 10.25
b) 3.25 e) 7.00
c) 3.75

$OCl^- + H_2O \rightleftharpoons HOCl + OH^-$

	OCl^-	H_2O	HOCl	OH^-
I	1.0M	X	0	0
C	-x		+x	+x
E	1.0-x		x	x

$K_b = \frac{K_w}{K_a} = \frac{1.00 \times 10^{-14}}{3.1 \times 10^{-8}} = 3.23 \times 10^{-7}$

$\frac{x^2}{1.0} = 3.23 \times 10^{-7}$

$x = 5.68 \times 10^{-4}$

$x = [OH^-] = 5.68 \times 10^{-4}$

$pH = \boxed{10.75}$

$\frac{x^2}{.00125 - x} = 3.5 \times 10^{-8}$

$x^2 = 4.38 \times 10^{-11} - 3.5 \times 10^{-8} x$

$x^2 + 3.5 \times 10^{-8} x - 4.38 \times 10^{-11} = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = 6.6 \times 10^{-6} = [H^+]$

$pH = \boxed{5.18}$

Go Vikings!!