Unit 6, Day 7

Acids & Bases – Part V

Quiz

- 1 M HF & 1 M NaF, pKa of HF = 3.14 pH is
  answer: 3.14

- Find ratio of molarities of acetate ion & acetic acid needed to buffer a soln @ pH = 5.25. The pK_a of CH_3COOH is 4.75.
  answer C) 3.2 to 1 * Henderson Rule*

Answer has to be greater than 1

Calculating pH of a Buffer
- acidic or basic? (K_a or K_b)
- Any additional acid or base been added to buffer?
- Complete neutralization, calculate M
- Find pH using correct Henderson/Hasselbach equation

* Alkaline means Basic soln*

- Microbe survives in an alkaline environment pH > 9
  Best choice for buffering system would be equal molar amounts of?

A) $C_2H_5NH_2$, $C_2H_5NH_3^+$, $K_b = 5.6 \times 10^{-4}$
(exponent)

Estimate → Basic: $pK_b \approx 4$, pOH = 4 pH ≈ 10

Acid Base Titration

why?
- Have a soln w/ unknown property
- unknown concentration?
- (More)

Titrant - substance you know well
Analyte - substance you are trying to figure out

pH = 7 (equivalence pt, stoichiometric pt)

V · M = moles

on graph
Half-way pt = equal amounts of acid & salt
↳ pH = pKa

Bromthymol Blue - blue in Basic environ.
green = neutral, acidic = yellow

acid form: protenated: protons are on

Basic = deprotenated

shift
pH > pKa protons come off

- At pH = 2, How many protons are on molecule

$K_{a_1} = 7.4 \times 10^{-4}$ $pK_{a_1} = 3.13$
$K_{a_2} = 1.9 \times 10^{-5}$ $pK_{a_2} = 4.77$
$K_{a_3} = 9.0 \times 10^{-7}$ $pK_{a_3} = 6.4$

c) 3 environment where pH is 2 pH is smaller than pKa