<u>Indicators and Titrations Practice</u>

- 1.) If an indicator HIn is yellow in acids and blue in bases, what would the colour of the anion (In-) be?
- 2.) Thymol blue is an indicator that changes colour from 8.0-9.6 on the pH scale. Its equivalence point is at a pH of 8.8. What is an estimate of the K_a value?
- 3.) If you mix thymol blue and alizarin yellow with a solution of $1.0 \times 10^{-4} \, M \, NaOH$ what colour would the solution be? (Hint use your acid-base indicators chart)

4.) You found the following results (below) when a solution was tested against three indicators. What is the pH range of the solution?

Indicator	Colour
Methyl red	yellow
Phenol red	red
Phenolphthalein	colourless

5.) If the following acids and bases are titrated against each other, will the resulting solution be acidic, neutral, or basic? Which indicators would be a good choice for testing for the equivalence point?

a.) HF + NaOH

b.) LiOH + HBr

d.) $C_6H_5COOH + Ca(OH)_2$

e.) HNO₃ + KOH

6.)	When titrating benzoic acid (C_6H_5COOH) it requires $28.4 \ mL \ of \ 0.125 \ M \ NaOH$. The initial pH of the acid was 2.628 and the pH at the halfway point is 4.191.
	a.) What is K_{α} for benzoic acid?
	b.) What is the starting concentration of the acid?
7.)	A solution of $25.0 mL C_3H_4N_2$ (imidazole) has a pH of 10.104 . This solution is titrated with $36.8 mL of 0.0986 M HCl$. The pH at halfway to the equivalence point is 7.047 . a.) What is the K_b of the imidazole?
	b.) What is the [imidazole] when calculated from the [HCl] and the volumes of HCl and imidazole?
	c.) What is the [imidazole] when calculated from the K_b and the initial pH?