

Pre-Lab Questions



$$2. K_a = \frac{[\text{H}^+][\text{H}_2\text{PO}_4^-]}{[\text{H}_3\text{PO}_4]} = 7.5 \times 10^{-3}$$

$$3. K_a = [\text{H}^+] = 7.5 \times 10^{-3}$$

$$-\log(7.5 \times 10^{-3}) = 2.12$$

4. Phenolphthalein doesn't work because its color changes after the pH of K_a 2.12.

Orange IV changes after 2, so Orange IV would be the best indicator.

$$5. \frac{5.5632 \text{ g}}{209 \text{ g}} \times \frac{1 \text{ mol}}{209 \text{ g}} = .00776 \text{ mol} \times \frac{1}{.0236 \text{ L}} = .116 \text{ M NaOH}$$

7. a. graph

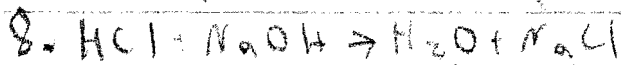
b. 8.5

c. Half equivalence at 12.5 mL, $\text{pH} = \text{p}K_a$

$$\text{p}K_a = 4.76$$

$$K_a = 10^{-4.76} = 1.74 \times 10^{-5}$$

d. Thymol blue because its pH interval is from 8.0-9.6 which work for a pH of 8.5



$$9. \frac{.005 \text{ L} \times .1 \text{ mol}}{1 \text{ L}} \Bigg| \frac{1 \text{ L}}{.1 \text{ mol HCl}} = .005 \text{ L} = 5 \text{ mL}$$

11. Neutral because the strong acid is mixing with a strong base.



14. Basic, because a strong base is mixing w/ a weak acid.

15. If an indicator is used, it will change the color's solution when the reaction is complete.

Post Lab Questions

1. Because the graduated cylinder has more markers than the beaker, using the graduated cylinder would provide a more accurate answer with more sig. figs.

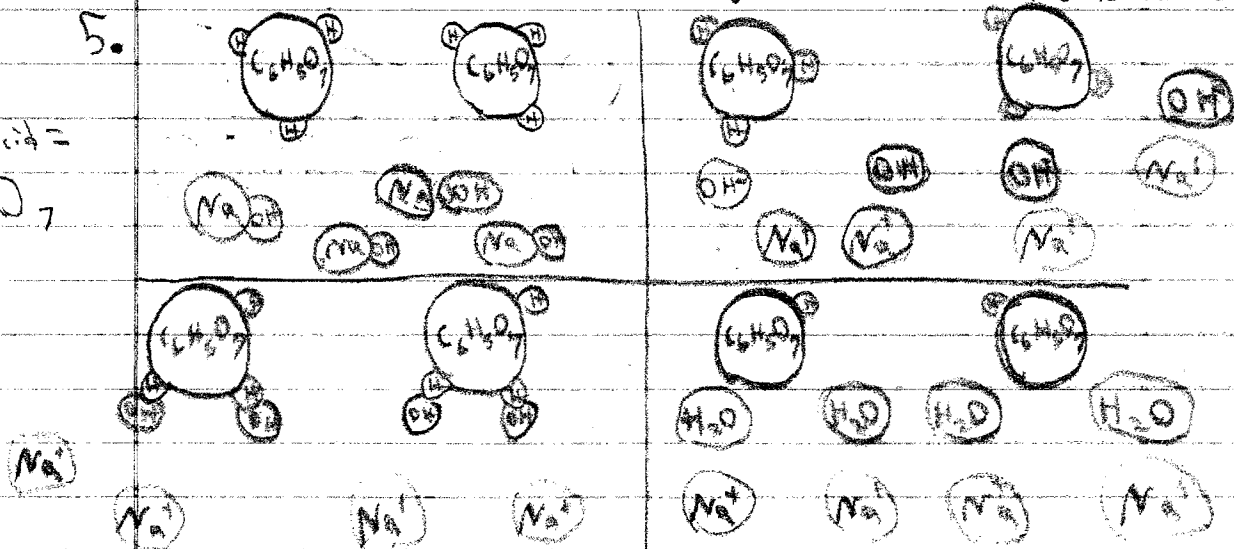
2. It would make the titrate a weaker base because the water would lower the concentration, thus, it would affect the pH of the acid.

3. Nobody titrated a cola

4. It would change their average in which the average would be greater than it should be.

5.

citric acid = $C_6H_8O_7$



6. we didn't use an indicator.

7. I recommend that a person with acid-reflux disease or tooth decay to drink Orange Soda instead of Orange Soda because Orange Juice is more acidic.