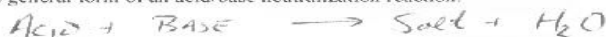


Name: KEY

**Honors Chemistry Worksheet: Acids and Bases**

1. Complete the table to summarize the properties of acids and bases. Identify as an (A)cid or (B)ase.
- |                                       |                                    |   |
|---------------------------------------|------------------------------------|---|
| a.) <u>B</u> lye                      | f.) <u>B</u> blood                 | k.) <u>B</u> pH= 9.20                           |
| b.) <u>B</u> soap and detergent       | g.) <u>A</u> pH = 3.0              | l.) <u>A</u> TIA dissociates 0.3%               |
| c.) <u>B</u> ammonia, NH <sub>3</sub> | h.) <u>B</u> Ba(OH) <sub>2</sub>   | m.) <u>B</u> bitter taste                       |
| d.) <u>A</u> litmus turns red         | i.) <u>A</u> phenolphthalein clear | n.) <u>B</u> OH <sub>(aq)</sub>                 |
| e.) <u>A</u> vinegar                  | j.) <u>A</u> HOCl                  | o.) <u>A</u> 1 M H <sub>3</sub> PO <sub>4</sub> |

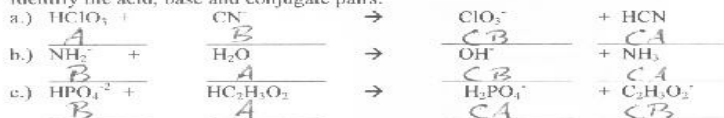
2. Write the general form of an acid/base neutralization reaction:



3. Write a balanced chemical equation and describe how a chemist could prepare the salt Li<sub>3</sub>PO<sub>4</sub>.



4. Identify the acid, base and conjugate pairs.



5. Name or write the formula for the following acids.

- |   |                           |   |                   |
|---|---------------------------|---|-------------------|
| a.) H <sub>2</sub> S  | <u>hydrosulfuric acid</u> | g.) <u>H<sub>2</sub>AsO<sub>3</sub></u>                         | arsenous acid     |
| b.) H <sub>2</sub> SO <sub>3</sub>                              | <u>sulfurous</u>          | h.) <u>HClO<sub>4</sub></u>                                     | perchloric acid   |
| c.) H <sub>2</sub> SO <sub>4</sub>                              | <u>sulfuric</u>           | i.) <u>H<sub>2</sub>Se</u>                                      | hydroselenic acid |
| d.) HBrO <sub>3</sub>   | <u>bromic</u>             | j.) <u>H<sub>2</sub>CrO<sub>4</sub></u>                         | chromic acid      |
| e.) H <sub>3</sub> C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> | <u>Citric</u>             | k.) <u>H<sub>2</sub>C<sub>4</sub>H<sub>4</sub>O<sub>6</sub></u> | tartaric acid     |
| f.) HC <sub>2</sub> O <sub>4</sub>                              | <u>oxalic</u>             | l.) <u>H<sub>3</sub>PO<sub>3</sub></u>                          | phosphorous acid  |

6. Write a balanced chemical equation for the neutralization of chloric acid with calcium hydroxide.



- a.) What volume of 0.851 M calcium hydroxide is needed to neutralize 350.0 ml of 0.524 M chloric acid? 108 ml

$$0.350\text{L} \cdot 0.524 \frac{\text{mol}}{\text{L}} = 0.183 \text{ mol H}^+ \cdot \frac{1 \text{ mol OH}^-}{2 \text{ mol H}^+} = 0.0917 \text{ mol} \cdot \frac{1000 \text{ ml}}{0.851 \text{ mol}} = 108 \text{ ml}$$

- b.) If 25.0 ml of 0.0635 M chloric acid was required to neutralize 8.28 ml of calcium hydroxide what is the molarity of the base?

$$0.0250\text{L} \cdot 0.0635 \frac{\text{mol}}{\text{L}} = 0.00159 \text{ mol H}^+ \cdot \frac{1 \text{ OH}^-}{2 \text{ H}^+} = 7.94 \times 10^{-4} \text{ mol Ca(OH)}_2 = 0.0959 \text{ M} \cdot \frac{0.00828 \text{ L}}{0.00828 \text{ L}}$$

7. Given the reaction of KHP (KHC<sub>8</sub>H<sub>4</sub>O<sub>4</sub>) with NaOH: KHC<sub>8</sub>H<sub>4</sub>O<sub>4</sub> + NaOH → NaKC<sub>8</sub>H<sub>4</sub>O<sub>4</sub> + H<sub>2</sub>O

- a.) What mass of KHP is needed to completely react with 25.0 ml of 0.10 M NaOH.

$$0.0250\text{L} \cdot 0.10 \frac{\text{mol}}{\text{L}} = 0.00250 \text{ mol OH}^- \cdot \frac{1}{1} \cdot \frac{204 \text{ g}}{1 \text{ mol}} = 0.51 \text{ g KHP}$$

- b.) If 29.41 ml of NaOH neutralized 0.488g of KHP what is the molarity of the NaOH?

$$0.488 \text{ g} \cdot \frac{1 \text{ mol}}{204 \text{ g}} = 0.00239 \text{ mol} = 0.02941 \text{ L} \cdot \text{M} = 0.0813 \text{ M NaOH}$$