

# Exercise 14.1a

## Acids & Bases

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Per: \_\_\_\_\_

**DIRECTIONS:** Answer the following in the space provided.

1. Complete the following table:

	Acids	Bases
Arrhenius Definition:	<i>donate H<sup>+</sup> in aqueous solution</i>	<i>donate OH<sup>-</sup> in aqueous solution</i>
Electrolyte?	<i>yes</i>	<i>yes</i>
Taste:	<i>sour</i>	<i>bitter</i>
Turns litmus:	<i>red</i>	<i>blue</i>
Texture on hands:	<i>does</i>	<i>slippery (soapy)</i>
Reactive w/metals to form H <sub>2</sub> gas?	<i>with most metals, not all</i>	<i>nope</i>

2. A(n) binary acid has only two elements, though they may exist in multiple ratios. Their names will always include the prefix hydro- and the suffix ic. Acids that have oxygen in their structure are called oxyacids (or oxoacids) and will have no prefixes. They will, however, have either the suffix ic or, ous. The suffix has to do with the number of number of oxygen atoms in the anion.
3. Complete the table (some boxes will be blank):

Naming Acids					
Acid	Anion Suffix	Acid Prefix	Acid Root	Acid Suffix	Acid Name
HCl	<i>-ide</i>	<i>hydro</i>	<i>chlor</i>	<i>ic</i>	<i>hydrochloric acid</i>
HClO	<i>-ite</i>	<i>NA</i>	<i>chlor</i>	<i>ous</i>	<i>hypochlorous acid</i>
HClO <sub>2</sub>	<i>-ite</i>	<i>NA</i>	<i>chlor</i>	<i>ous</i>	<i>chlorous acid</i>
HClO <sub>3</sub>	<i>-ate</i>	<i>NA</i>	<i>chlor</i>	<i>ic</i>	<i>chloric acid</i>
HClO <sub>4</sub>	<i>-ate</i>	<i>NA</i>	<i>chlor</i>	<i>ic</i>	<i>perchloric acid</i>

4. Using your common ion chart as a reference, name/write the formula for the following aqueous substances.

- |  |  |
|--|--|
| a. H <sub>2</sub> SO <sub>4</sub> <u>sulfuric acid</u> | g. HNO <sub>3</sub> <u>nitric acid</u>   |
| b. nitrous acid <u>HNO<sub>2</sub></u>                 | h. acetic acid <u>HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> (or CH<sub>3</sub>COOH)</u> |
| c. H <sub>2</sub> S <u>hydrosulfuric acid</u>          | i. H <sub>3</sub> PO <sub>3</sub> <u>phosphorous acid</u>                              |
| d. hydroselenic acid <u>H<sub>2</sub>Se</u>            | j. oxalic acid <u>H<sub>2</sub>C<sub>2</sub>O<sub>4</sub></u>                          |
| e. H <sub>2</sub> CO <sub>3</sub> <u>carbonic acid</u> | k. H <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> <u>dichromic acid</u>                 |
| f. permanganic acid <u>HMnO<sub>4</sub></u>            | l. hydroiodic acid <u>HI</u>   |

5. Arrhenius acids produce hydrogen (H<sup>+</sup>) ions in water, whereas Arrhenius bases produce hydroxide (OH<sup>-</sup>) ions in water. The H<sup>+</sup> ion produced by an acid in solution bonds to water forming a(n) hydronium ion represented by the formula (H<sub>3</sub>O<sup>+</sup>).
6. Classify each of the following as an Arrhenius acid or base from its formula:

- |  |   |
|--|---|
| a. Ba(OH) <sub>2</sub> <u>Arrhenius base</u>           | e. HBr <u>Arrhenius acid</u>                          |
| b. KNO <sub>2</sub> <u>neither, but is an B-L base</u> | f. HCN <u>Arrhenius acid</u>                          |
| c. KOH <u>Arrhenius base</u>                           | g. LiOH <u>Arrhenius base</u>                         |
| d. Mg(OH) <sub>2</sub> <u>Arrhenius base</u>           | h. NH <sub>3</sub> <u>neither, but is an B-L base</u> |

# Exercise 14.1a

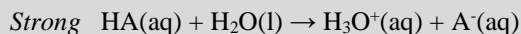
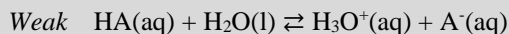
## Acids & Bases

Name: \_\_\_\_\_

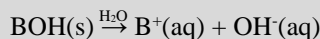
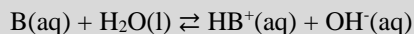
Date: \_\_\_\_\_ Per: \_\_\_\_\_

Strong acids and bases completely ionize in water. This means that essentially 100% of the acid or base forms products (the arrow in the chemical equation points one direction only). Weak acids and bases, however, only ionize partially before reaching a dynamic equilibrium (double arrows should be used in their formation equations).

### Acids



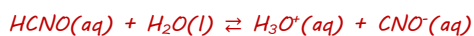
### Bases



**DIRECTIONS:** Answer the following in the space provided.

7. Write the equations (acid ionization equations) representing the ionization of each of these acids in aqueous solution.

a. HCNO (weak acid)



c. HNO<sub>3</sub> (strong acid)



b. HCl (strong acid)

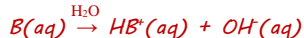


d. HC<sub>2</sub>H<sub>3</sub>O<sub>2</sub> (weak acid)

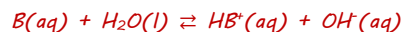


8. Write the equations (base dissociation equations) representing the dissociation of each of these bases in aqueous solution.

a. NaOH (strong base)



c. CH<sub>3</sub>NH<sub>2</sub> (weak base)



b. NH<sub>3</sub> (weak base)



d. KOH (strong base)

