

# Guided Notes: Properties of Acids and Bases

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

## Properties of Acids:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Properties of Bases:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Acid Base Solutions:

\_\_\_\_\_ : (solutions with H<sub>2</sub>O) all contain H<sup>+</sup> (\_\_\_\_\_ ions) and OH<sup>-</sup> (\_\_\_\_\_ ions)

acidic solutions: contain more \_\_\_\_\_

basic solutions: contain more \_\_\_\_\_

neutral solutions: contain \_\_\_\_\_ (water; pH = \_\_\_\_\_)

## The Proton H<sup>+</sup>

- an H<sup>+</sup> is just a \_\_\_\_\_
- \_\_\_\_\_ exist in solution by itself
- will joint with a water molecule to become \_\_\_\_\_
- \_\_\_\_\_ is called the hydronium ion
- \_\_\_\_\_ and \_\_\_\_\_ can be used interchangeably in chemical reactions

## Arrhenius Acids and Bases

\_\_\_\_\_ : contains hydrogen, ionizes to form a hydrogen ion solution

ex: \_\_\_\_\_

\_\_\_\_\_ : contains hydroxide, ionizes to form a hydroxide ion solution

ex: \_\_\_\_\_

--- Works for \_\_\_\_\_ acids and bases but not all the time.

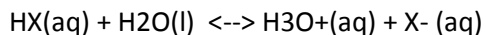
## Bronsted Lowry Acids and Bases:

-- more \_\_\_\_\_ model

Bronsted - Lowry Acid: \_\_\_\_\_

Bronsted - Lowry Base: \_\_\_\_\_

Using HX as a general formula for an acid



Bronsted-Lowry Acid:

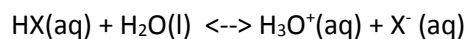
Bronsted Lowry Base:

## Conjugate Acids and Bases:

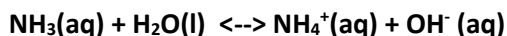
•Both the forward and the reverse reactions are acid-base reactions

\_\_\_\_\_ : substance produced when a base accepts a proton (H<sub>3</sub>O<sup>+</sup>)

\_\_\_\_\_ : substance produced when an acid donates a hydrogen ion (X<sup>-</sup>)



\_\_\_\_\_ : substances related to each other by donating and accepting a single hydrogen ion



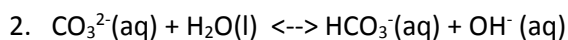
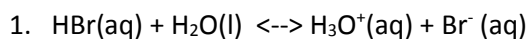
What are the conjugate acid/base pairs?

Does  $\text{NH}_3$  fit the Arrhenius model of a base?

Is water an acid or a base?

\_\_\_\_\_ : substances that can act as both an acid and a base. ex: \_\_\_\_\_

Practice: Identify the acid-base pairs in the following reactions.



### **Monoprotic and Polyprotic Acids:**

For a hydrogen ion to be \_\_\_\_\_, it must be bonded to a highly \_\_\_\_\_ element. (F, Cl, Br, I, O, N, S)

\_\_\_\_\_ : a substance that can only donate 1 hydrogen ion per molecule

ex: HBr, HCl, HI,  $\text{CH}_3\text{COOH}$

\_\_\_\_\_ : a substance can donate more than 1 hydrogen ion per molecule

ex:  $\text{H}_3\text{PO}_4$  and  $\text{H}_2\text{SO}_4$

-- will ionize in steps, not all at once

### **Check for Understanding:**

1. Identify the conjugate acid-base pairs in the reactions below.

2. Determine if the Bronsted acid is monoprotic or polyprotic, and binary or tertiary.

