

Name \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

Chemistry 12  
**BRØNSTED-LOWRY ACIDS & BASES**



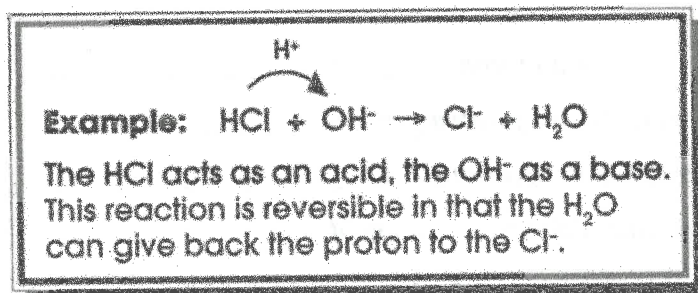
1. Write the formula for a **proton**  $H^+$
2. Write the formula for a **hydrated proton**  $H_3O^+$
3. Write the formula for a **hydronium ion**  $H_3O^+$
4. Give the **Arrhenius** definition of an **acid** any substance which releases  $H^+$  ions in  $H_2O$
5. Give the **Arrhenius** definition of a **base** any substance which releases  $OH^-$  ions in  $H_2O$
6. Give the **Brønsted-Lowry** definition of an **acid** a substance that can donate a proton to another substance
7. Give the **Brønsted-Lowry** definition of a **base** a substance that can accept a proton from another substance
8. What is an **amphiprotic anion**? substances that can act as either an acid or base
9. Give 4 examples of amphiprotic anions. (Note – you may want to complete the next two pages first 😊)
 

a) <u><math>H_2PO_4^-</math></u> b) <u><math>HPO_4^{2-}</math></u> + others	c) <u><math>HSO_4^-</math></u> d) <u><math>HC_2O_4^-</math></u>
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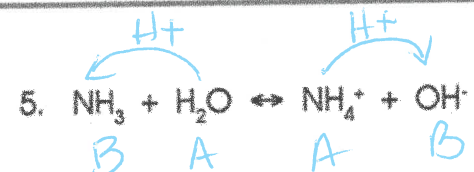
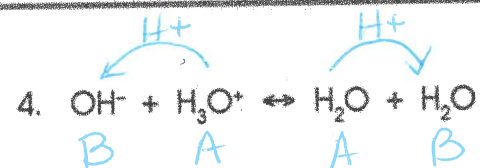
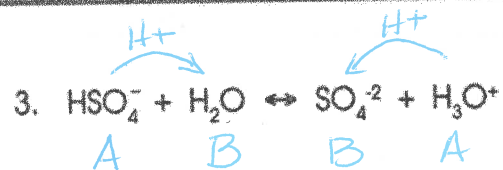
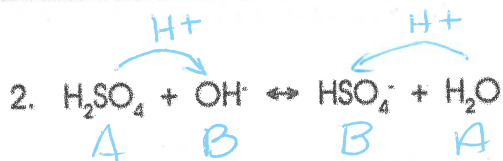
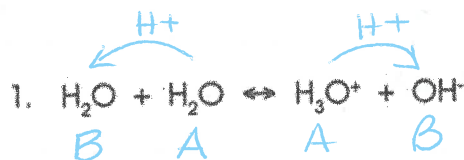
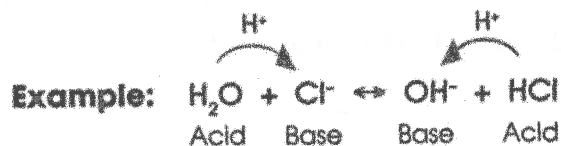
# BRONSTED-LOWRY ACIDS AND BASES

Name \_\_\_\_\_

According to Bronsted-Lowry theory, an acid is a proton ( $H^+$ ) donor, and a base is a proton acceptor.



Label the Bronsted-Lowry acids and bases in the following reactions and show the direction of proton transfer.



**CONJUGATE ACID-BASE PAIRS**

Name \_\_\_\_\_

In the exercise, Bronsted-Lowry Acids and Bases, it was shown that after an acid has given up its proton, it is capable of getting back that proton and acting as a base. Conjugate base is what is left after an acid gives up a proton. The stronger the acid, the weaker the conjugate base. The weaker the acid, the stronger the conjugate base.

Fill in the blanks in the table below.

**Conjugate Pairs**

	ACID	BASE	EQUATION
1.	$\text{H}_2\text{SO}_4$	$\text{HSO}_4^-$	$\text{H}_2\text{O} + \text{H}_2\text{SO}_4 \leftrightarrow \text{H}_3\text{O}^+ + \text{HSO}_4^-$
2.	$\text{H}_3\text{PO}_4$	$\text{H}_2\text{PO}_4^-$	$\text{H}_3\text{PO}_4 + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{H}_2\text{PO}_4^-$
3.	$\text{HF}$	$\text{F}^-$	$\text{HF} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{F}^-$
4.	$\text{HNO}_3$	$\text{NO}_3^-$	$\text{HNO}_3 + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{NO}_3^-$
5.	$\text{H}_2\text{PO}_4^-$	$\text{HPO}_4^{2-}$	$\text{H}_2\text{PO}_4^- + \text{H}_2\text{O} \rightleftharpoons \text{HPO}_4^{2-} + \text{H}_3\text{O}^+$
6.	$\text{H}_2\text{O}$	$\text{OH}^-$	$\text{H}_2\text{O} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{OH}^-$
7.	$\text{HSO}_4^-$	$\text{SO}_4^{2-}$	$\text{HSO}_4^- + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{SO}_4^{2-}$
8.	$\text{HPO}_4^{2-}$	$\text{PO}_4^{3-}$	$\text{HPO}_4^{2-} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{PO}_4^{3-}$
9.	$\text{NH}_4^+$	$\text{NH}_3$	$\text{NH}_4^+ + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{NH}_3$
10.	$\text{H}_3\text{O}^+$	$\text{H}_2\text{O}$	$\text{H}_3\text{O}^+ \rightleftharpoons \text{H}^+ + \text{H}_2\text{O}$