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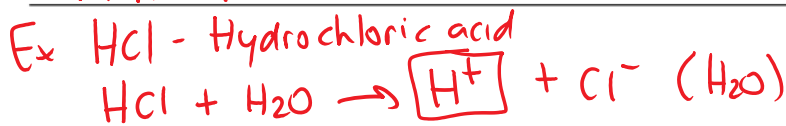
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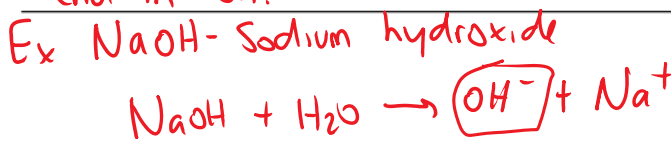
**Chemical Reactions:**

Lesson 10 – Acids and Bases

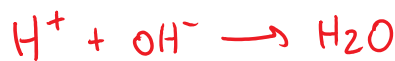
Acids: A chemical that when dissolved produces  $H^+$  ion. Acid chemical formula all start with H



Bases: A chemical that when dissolved produces  $OH^-$  ions (hydroxide). Base chemical formula end in OH.



Neutralization: When an acid and a base are mixed the  $H^+$  ions and  $OH^-$  ions combine to form water. Water is a neutral solution.



pH scale: A scale that measures the strength of acids and base

Ex. pH 2  $\rightarrow$  pH 3

Change of  $\times 10$

Acid is 10x weaker

Ex. pH 5  $\rightarrow$  pH 3

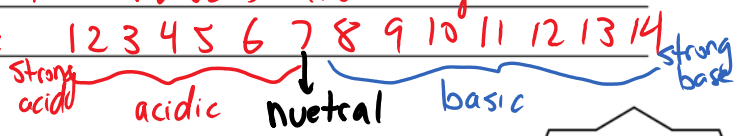
$10 \times 10 = 100x$

acid is 100x stronger

Ex. pH 9  $\rightarrow$  pH 6

$10 \times 10 \times 10 = 1000x$

base becomes 1000x more acidic



**Change**  
Each increase in pH increases/decreases the concentration by a factor of 10.

pH Indicators: Substances used to safely test the pH of a substance

Litmus Paper: A paper strip that changes colour depending on pH

Blue Paper: Changes red in an acid

Red Paper: Changes blue in a base

**RED** → **ACID**      **BLUE** → **BASE**

Universal Indicator: Change to many different colours to tell you specifically what pH is

Bromothymol Blue      1 2 3 4 5 6 7 8 9 10 11 12 13 14  
Ex. pH 10      Red      orange/yellow      green      Blue      violet

Litmus → Blue

Phen → Pinkish / purple

BB → Blue

You Try:

1) When the pH rises from 10 to 12, how many times more basic has the solution become?

$10 \times 10 = 100 \times$  more basic

2) What colour is litmus paper in an acidic solution?

**RED!**

3) What colour is bromthymol blue at the following pH levels?

a) pH 5

**yellow/orange**

b) pH 7

**green**

c) pH 9

**Blue**

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**Chemical Reactions:**  
Lesson 11 – Properties Acids and Bases

Property	Acid	Base
Taste	Sour	Bitter
Touch	will burn Corrosive	Slippery
Litmus	Red	Blue
Reaction with some metals, such as magnesium or zinc	Corrodes metals	no reaction
Electrical Conductivity	conducts	conduct
pH	less than 7	more than 7
Production of ions	$H^+$	$OH^-$



## Chemical Reactions:

### Lesson 12 – Neutralization and Salts

Salt: An ionic compound that does not contain hydrogen (H) or hydroxide (OH). An ionic compound that is not an acid or a base

Ex NaCl, MgI<sub>2</sub>, Ag<sub>2</sub>S

3 ways to produce salt:

1) Acid and a Metal

acid + metal → Salt + hydrogen gas



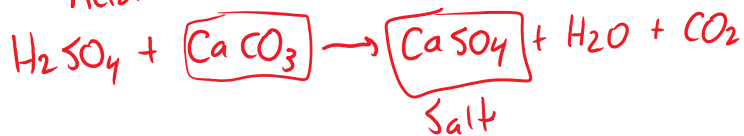
The best metals to bond are Alkali and alkaline earth metals.



→ CO<sub>3</sub> kaboom!

2) Acid and a Carbonate

Acid + Carbonate → Salt + water + carbon dioxide



A compound is a carbonate if you have a metal and carbonate (CO<sub>3</sub>) ionically bonded.

3) Neutralization

Acid + Base → water + Salt

