**WARM UP AND LEARNING TARGETS LOG**

| *Date* | *Learning Target* | *Warm Up* |
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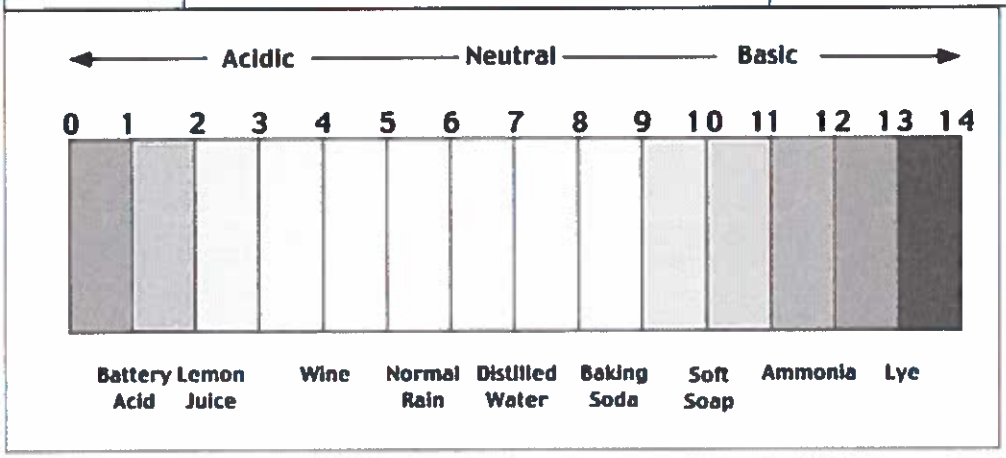
UNIT 5.1

# Introduction to Acids and Bases

*Why are acids and bases chemical opposites?*

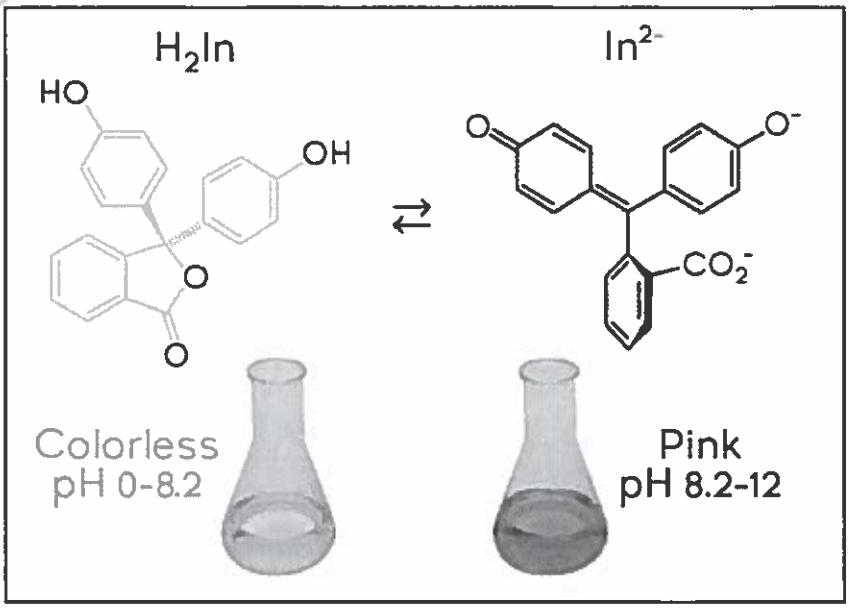
| | Acid | Base |
|---|---|---|
| Definition | ○ An acid is a solution that has an excess of ___H+___ ions.<br>○ The more ___H+___ ions, the more acidic the solution. | ○ A base is a solution that has an excess of ___OH-___ ions<br>○ Bases are also defined as substances that can accept ___H+___ ions |
| Taste | sour | bitter |
| Electrolyte? (conduct electricity) | yes | yes |
| Other properties | ○ ___corrosive___, which means they break down certain substances. Many acids can corrode fabric, skin, and paper<br>○ Some acids react strongly with metals | ○ Feel ___slippery___<br>○ Corrosive<br>○ Do not react with metals |
| Turns litmus paper... | red | blue |
| Uses | ○ Acetic acid = ___vinegar___<br>○ ___citric___ acid = lemons, limes, and oranges. It is in many sour candies such as lemonhead and sour patch.<br>○ Ascorbic acid = Vitamin C<br>○ Sulfuric acid is used in the production of fertilizers, steel, paints and plastics<br>○ Car batteries | ○ Bases give soaps, ammonia, and many other cleaning products some of their useful properties<br>○ The $OH^-$ ions interact strongly with certain substances, such as dirt and grease<br>○ ___chalk___ and ___oven cleaner___ are examples of familiar products that contain bases<br>○ Your ___blood___ is a basic solution |
| pH | less than 7 | greater than 7 |



UNIT 5.2

# Indicators

*How can we use color changes to determine the pH of a liquid?*

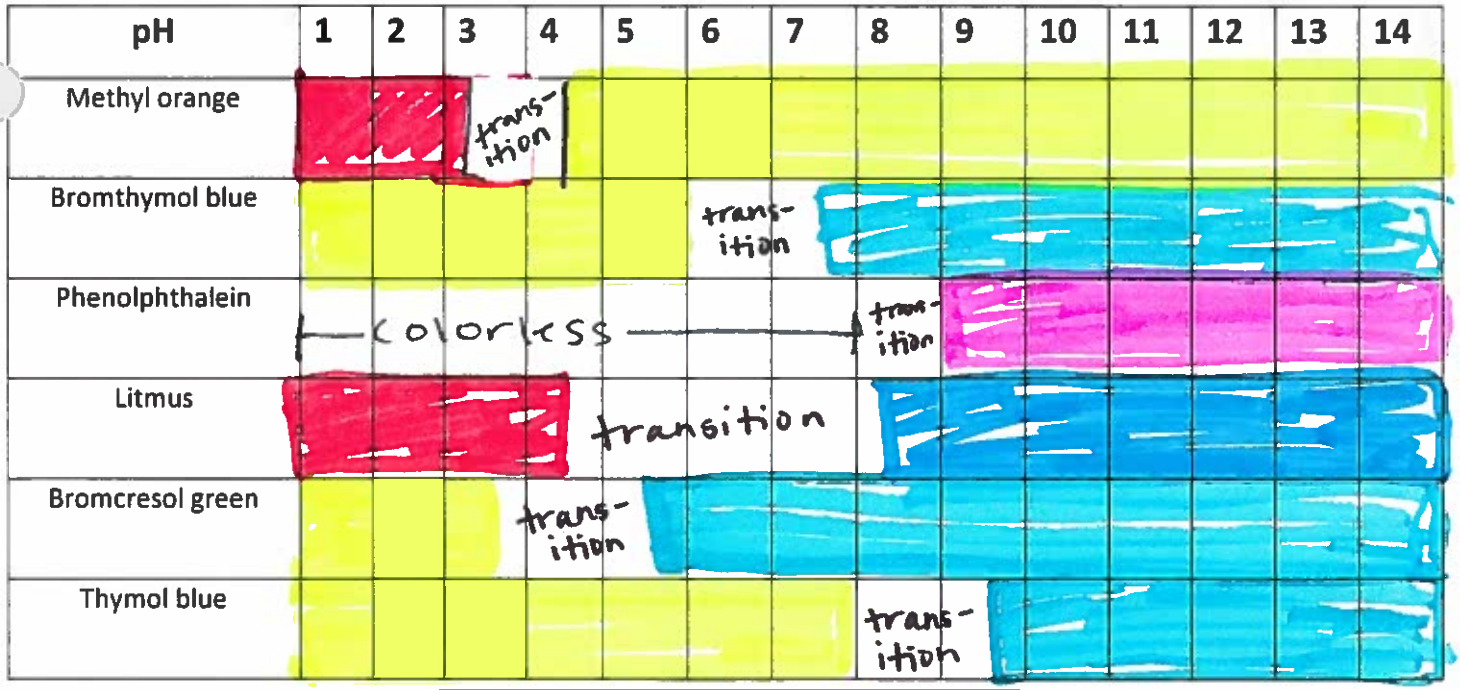



*What is going on in the image to the left?*

Certain substances, such as the one shown to the left (phenolphthalein), will change their structure as environmental conditions change (i.e. from acidic to basic).

The structure of a compound determines its properties, so a new structure will lead to new properties, such as a new **color**. These color-changing compounds are known as indicators.

**Indicator:** compound that can indicate (show) whether a solution is above or below a certain pH range

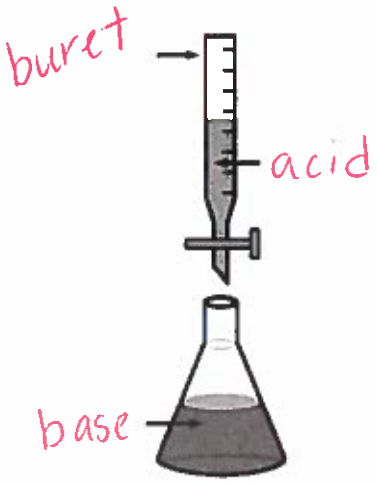



| Indicator | Approximate pH Range for Color Change | Color Change |
|---|---|---|
| methyl orange | 3.1–4.4 | red to yellow |
| bromthymol blue | 6.0–7.6 | yellow to blue |
| phenolphthalein | 8–9 | colorless to pink |
| litmus | 4.5–8.3 | red to blue |
| bromcresol green | 3.8–5.4 | yellow to blue |
| thymol blue | 8.0–9.6 | yellow to blue |

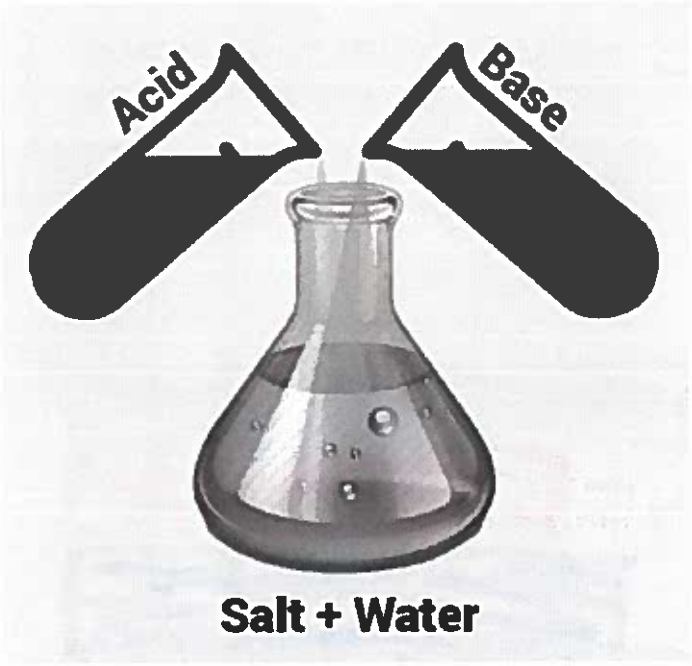
UNIT 5.3

# Neutralization and Titration

*What happens when you mix an acid with a base?*




- pH gives us a way to chemically determine whether one solution is more acidic or basic than another.
- Titration gives us a process to determine how much acid or base is present in any one substance.




Neutralization: Acids and bases can "cancel" one another out to make water and a salt (neutral)

*Example neutralization reaction:*

$$HCl + NaOH \rightarrow H_2O + NaCl$$

table salt!

So what?? Because acids and bases can "cancel" one another out, we can figure out how much acid or base is contained in a solution by adding a known amount of its "opposite."

1. Which 50-mL solution would require the most NaOH base to be added in order to be completely neutralized?
   a. Pineapple juice (pH 3)
   b. Coffee (pH 5)
   c. Hydrochloric acid (pH 1) most acidic
   d. Urine (pH 6)

2. Antacid A is able to neutralize 0.1 grams of stomach acid, while antacid B is able to neutralize 0.8 grams of stomach acid. Which is the stronger antacid and why?

   Antacid B - it can neutralize more acid.