Science 10 – Chapter 5.1 - Acids and Bases Name \_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_

* We already know how to classify compounds based one the type of bond they form.
	+ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: electrons transferred, ions made. (metal + non-metal)
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: electrons shared. (non-metal + non-metal)
* We can also classify compounds into many other categories:
* \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, salts, organics, inorganics

**ACIDS and BASES**

* **Some Common Acids**:
	+ Citrus juice - \_­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_, lemon and\_\_\_\_\_\_\_\_­\_\_\_\_. Vinegar, tomatoes.
	+ Anything with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ taste.
* We often add acids to our foods to improve taste and help us to absorb nutrients.

CAUTION!!!

* + Many Acids are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means they can burn your skin.
	+ Never attempt to identify an acid by touch or taste!
* **Some Common Bases**:
	+ ­­­­­ Eggs, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, soap \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Anything with a \_\_\_\_\_\_\_\_\_\_\_\_\_ taste and/or a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feel.

CAUTION!!!

* + Many Bases are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means they can burn your skin. (corrosive and caustic are basically the same meaning, just done by different chemicals)
	+ Never attempt to identify a base by touch or taste!

**The \_\_\_\_\_\_\_\_\_\_\_\_ Scale**:

A number scale for measuring how \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a solution is.

pH **below \_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_** pH **\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_** pH **above \_\_\_\_ = \_\_\_\_\_\_\_\_\_**



What do the numbers mean?

Each **decrease of \_\_\_\_\_\_\_**on the pH scale indicates **\_\_\_\_\_\_\_\_\_**more acidic.

* + - For example, pH 4 is **\_\_\_\_\_\_\_\_\_\_\_** more acidic than pH 5
		- pH \_\_\_\_\_ is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**more acidic than pH \_\_\_\_\_\_
		- pH \_\_\_\_\_\_ is **100 x** more acidic than pH 5

**What is pH Really Measuring?**

The pH of a solution refers to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of its \_\_\_\_\_\_\_ions.

CONCENTRATION is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of substance (solute) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a given \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of solution.

Square brackets are used to signify concentration, [H+], [OH–]

High [H+] = \_\_\_\_\_\_\_\_\_\_\_\_\_ pH, very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

High [\_\_\_\_\_\_\_\_] = \_\_\_\_\_\_\_\_\_\_\_\_\_ pH, very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**More about pH**

If a substance has a lot of \_\_\_\_\_\_\_\_\_ions then it has a low pH.

If a substance has a lot of \_\_\_\_\_\_\_\_\_\_ions then it has a high pH.

If a substance has the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ amount of H+ ions as it has OH- ions then it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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**pH Indicators**

The pH of acids and bases cannot directly be determined by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Instead, pH is measured by other chemicals called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or by a pH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that measures the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ of the solution.

pH indicators change \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ based on the solution they are placed in.

**pH and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Paper**

Litmus is the most common indicator, and is used on litmus paper.

Two colours of litmus paper:

Blue Red

pH above 7 (basic) \_\_\_\_\_\_\_\_\_\_\_\_ pH above 7 (basic) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

pH = 7 \_\_\_\_\_\_\_\_\_\_\_ pH = 7 \_\_\_\_\_\_\_\_\_\_\_

pH below 7 (acidic) \_\_\_\_\_\_\_\_\_\_\_\_ pH below 7 (acidic) \_\_\_\_\_\_\_\_\_\_\_\_\_

Memory device:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_🡪\_\_\_\_\_\_\_\_\_\_\_\_

**pH Probes**

A pH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ uses electrical probes to measure how solutions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electricity.

We said that acids and bases like to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when in solutions and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of these ions will determine a solution's ­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ conductivity.

**More about \_\_\_\_\_\_\_\_\_\_\_\_**

* Acids readily react with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* We can also identify Acids by looking at their chemical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The chemical formula of an acid usually starts with hydrogen \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Acids with a carbon usually have the \_\_\_\_\_\_\_\_\_ written \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ Acids often behave like acids only when dissolved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and so they often have the subscript \_\_\_\_\_\_\_\_\_
* Acids \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electricity because they release hydrogen ions, \_\_\_\_\_\_\_\_\_*(aq)*

**Common Acids**

* + - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**= hydrochloric acid **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**= nitric acid
		- **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**= Sulphuric acid **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**= acetic acid

**More about Bases**

* We can also identify Bases by looking at their chemical formula.
* The chemical formula of a base usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_ with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Bases release hydroxide ions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*(aq)*
* Bases often behave like bases only when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in water and so they often have the subscript (aq)
* Don’t readily react with metals

**Common Bases**

* + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*–*** *Sodium Hydroxide* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_–** Calcium *Hydroxide*
	+ **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*–*** *Magnesium Hydroxide* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_–** *Ammonium Hydroxide*

|  |  |
| --- | --- |
| Acids | Bases |
| **pH \_\_\_\_\_ than \_\_\_\_\_\_\_, corrosive**  | **pH \_\_\_\_\_ than \_\_\_\_\_\_\_, caustic**  |
| **Litmus turns \_\_\_\_\_\_\_\_\_\_\_\_** | **Litmus turns \_\_\_\_\_\_\_\_\_\_\_** |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electricity (when dissolved in water)**  | **\_\_\_\_\_\_\_\_\_\_\_ electricity (when dissolved in water)** |
| **Chemical Formula starts with \_\_\_\_** | **Chemical Formula ends with \_\_\_** |
| **React with \_\_\_\_\_\_ to produce H2 gas** | **Do not readily \_\_\_\_\_\_\_with metals** |

Review:

 We can classify acids and bases based on:

* Their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**What about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?**

* What is a salt???
* Salts are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compounds formed when acids and bases react.
	+ Salts are also produced when oxides or carbonates react with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_react with acids.
* Table salt, \_\_\_\_\_\_\_\_\_\_\_\_, is found in sea water, salt lakes or rock deposits.
* NaCl is only one kind of salt.
	+ A salt is made up of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ion from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ion from an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ Salts are found in many things:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_