**Vocabulary:** **Titration**



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* Acid – a water-soluble compound that is capable of donating protons (H+ ions) to another substance.
	+ Acids often are sour in taste, can burn the skin and eyes, and react with a *base* to produce a salt and water.
	+ The chemical formulas of acids usually begin with H. Examples are HCl (hydrochloric acid), H2SO4 (sulfuric acid), and HNO3 (nitric acid).
	+ There are several commonly-used definitions of acids and bases. The definition used here is the Brønsted-Lowry definition.
* Analyte – a substance that is being investigated.
	+ In a *titration*, the analyte is a substance of unknown composition or concentration that is placed in a flask.
* Base – a water-soluble chemical compound that is able to accept protons (H+ ions).
	+ Bases often are bitter in taste, have a slippery texture, and react with acids to produce a salt and water.
	+ The chemical formulas of bases usually end with OH. Examples are NaOH (sodium hydroxide), KOH (potassium hydroxide), and Ca(OH)2 (calcium hydroxide).
* Dissociate – to break up into smaller components.
	+ For example, when hydrochloric acid (HCl) is dissolved in water it dissociates into H+ and Cl-– ions.
	+ When sodium hydroxide (NaOH) dissolves in water it dissociates into Na+ and OH– ions.
	+ Different acids and bases have different levels of dissociation when added to water.
* Equivalence point – the point in a titration when there are equivalent amounts of *titrant* and analyte so the two substances can react completely with nothing left over.
	+ If 1 mole of titrant reacts with 1 mole of analyte, the equivalence point is reached when the moles of titrant and analyte are equal.
	+ If 2 moles of titrant react with 1 mole of analyte, the equivalence point is reached when there are exactly twice as many moles of titrant as analyte.
* Indicator – a substance that changes color when in contact with an acid or base.
	+ Examples of indicators include litmus, bromthymol blue, methyl orange, and phenolphthalein.
	+ Different indicators change color at different *pH* values.
* Litmus paper – a paper coated with an indicator called litmus, which is derived from a species of lichen.
	+ Litmus paper is produced as red and blue strips. In an acid, both strips turn blue. In a base, both strips turn red. In a neutral solution, the red strip remains red and the blue strip remains blue.
* Molarity – a measure of concentration equal to moles per liter.
	+ The symbol for molarity is M.
	+ Brackets are also used to signify molarity. For example, the statement
	“[HCl] = 0.1 M” indicates that 0.1 moles of HCl are dissolved in one liter of water.
* Neutralize – to make an acidic or basic solution chemically neutral.
	+ Acids can be neutralized through chemical reaction with bases, and vice versa. Most acid/base reactions produce a salt and water.
		- For example, the reaction of hydrochloric acid and sodium hydroxide produces water and sodium chloride (table salt):

HCl + NaOH 🡪 NaCl + H2O

* pH – a measure of the concentration of hydrogen ions [H+] in a solution.
	+ The symbol “pH” stands for “potential of hydrogen” or “power of hydrogen.”
	+ As [H+] increases, the solution becomes more acidic.
	+ The pH of a solution is equal to the negative base-10 logarithm of the concentration of hydrogen ions: pH = –log[H+].
* Strong acid – an acid that has a relatively high degree of dissociation in water.
* Strong base – a base that has a relatively high degree of dissociation in water.
* Titrant – a substance of known composition and concentration that is used to react with an analyte.
	+ In a titration, the titrant is the substance that is placed in the burette and added to the analyte in the flask.
* Titration – a process in which a chemical reaction is used to measure the concentration or to determine the identity of a solution.
* Titration curve – a graph of a titration in which the amount of titrant is recorded on the *x*-axis and the pH of the analyte is recorded on the *y*-axis.
* Weak acid – an acid that has a relatively low degree of dissociation in water.
	+ If a weak acid is neutralized by a strong base, the resulting solution is basic.
* Weak base – a base that has a relatively low degree of dissociation in water.
	+ If a weak base is neutralized by a strong acid, the resulting solution is acidic.