

Test 2 Equations that you need to memorize

Chapter 3

$$\text{Mass percentage} = \frac{\text{g of component}}{100 \text{ g of solution}}$$

$$\text{Volume percentage} = \frac{\text{mL of component}}{100 \text{ mL of solution}}$$

$$\text{ppm} = \frac{\text{mg of solute}}{\text{L of solution}}$$

$$\text{ppb} = \frac{\mu\text{g of solute}}{\text{L of solution}}$$

Chapter 4

Strong Acids

Name	Formula	Ions
Hydrochloric acid	HCl	$\text{H}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
Hydrobromic acid	HBr	$\text{H}^+(\text{aq}) + \text{Br}^-(\text{aq})$
Hydroiodic acid	HI	$\text{H}^+(\text{aq}) + \text{I}^-(\text{aq})$
Nitric acid	HNO_3	$\text{H}^+(\text{aq}) + \text{NO}_3^-(\text{aq})$
Perchloric acid	HClO_4	$\text{H}^+(\text{aq}) + \text{ClO}_4^-(\text{aq})$
Chloric Acid	HClO_3	$\text{H}^+(\text{aq}) + \text{ClO}_3^-(\text{aq})$
Sulfuric acid	H_2SO_4	$\text{H}^+(\text{aq}) + \text{HSO}_4^-(\text{aq})$

Strong Bases

Solubility Rules

Name	Formula	Ions
Lithium hydroxide	LiOH	$\text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq})$
Sodium hydroxide	NaOH	$\text{Na}^+(\text{aq}) + \text{OH}^-(\text{aq})$
Potassium hydroxide	KOH	$\text{K}^+(\text{aq}) + \text{OH}^-(\text{aq})$
Rubidium hydroxide	RbOH	$\text{Rb}^+(\text{aq}) + \text{OH}^-(\text{aq})$
Cesium hydroxide	CsOH	$\text{Cs}^+(\text{aq}) + \text{OH}^-(\text{aq})$
Calcium hydroxide	$\text{Ca}(\text{OH})_2$	$\text{Ca}^{2+}(\text{aq}) + 2 \text{OH}^-(\text{aq})$
Strontium hydroxide	$\text{Sr}(\text{OH})_2$	$\text{Sr}^{2+}(\text{aq}) + 2 \text{OH}^-(\text{aq})$
Barium hydroxide	$\text{Ba}(\text{OH})_2$	$\text{Ba}^{2+}(\text{aq}) + 2 \text{OH}^-(\text{aq})$

Rules for assigning oxidation numbers

Soluble Ions	Exceptions
$\text{Li}^+, \text{Na}^+, \text{K}^+, \text{Rb}^+, \text{Cs}^+, \text{NH}_4^+$	None
$\text{C}_2\text{H}_3\text{O}_2^-, \text{NO}_3^-, \text{ClO}_3^-, \text{ClO}_4^-$	None
$\text{Cl}^-, \text{Br}^-, \text{I}^-$	$\text{Ag}^+, \text{Pb}^{2+}$
SO_4^{2-}	$\text{Ag}^+, \text{Pb}^{2+}, \text{Ca}^{2+}, \text{Sr}^{2+}, \text{Ba}^{2+}$

1. The sum of oxidation state for all atoms in a molecule or polyatomic ion equals the charge of the molecule or ion (indicated as a superscript)
2. The oxidation state of an atom in an elemental substance is zero
3. The oxidation state of a monatomic ion is equal to the ion's charge
4. Group 1 metals and silver have +1 oxidation states. Group 2 atoms and zinc have +2 oxidation states. Aluminum has a +3 oxidation state.
5. Hydrogen is +1 when combined with nonmetals and -1 when combined with metals
6. Oxygen is -2 in most compounds but is occasionally -1 in peroxides, O_2^{2-} .
7. Other atoms follow the previously discussed common charges

$$\text{Percent Yield} = \frac{\text{Actual Yield}}{\text{Theoretical Yield}} \times 100$$