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| **Reference Sheet** |  |
| **Variables**  D = density m = mass  V = volume K = kelvin  P = pressure R = gas constant  T = temperature M = molarity  n = number of moles N = normality  q = quantity of heat energy S= entropy  Cp = specific heat G= Gibbs Free Energy  Hv = heat of vaporization H= enthalpy  Hf = heat of fusion  Kw = equilibrium constant  for the ionization of water  **Conversions**  1 ATM = 760 mmHg = 760 torr = 101.3 kPa  1 cm3 = 1 mL  **For Water:** 1 Kg = 1 L 1 g = 1 mL  STP: 1 ATM & 273.1 K  AT STP: 1 Mol Gas = 22.4 L  **Simple Formulas**  *Oxidation Number:*  *0= Subscript of Metal (X) + Subscript non-metal (Ox #)* | **Simple Formulas Continued**  x 100  Percent Yield = Lab Value  Theoretical or expected X 100  Percent Error = X 100    ΔG0 = ΔH - TΔS    moles = M \* V  *Normality (N) = Molarity \* # of Equivalence* |
| **Simple Mole Map:**  **÷** Molar Mass X 6.022 x1023 atoms/molecules  **Grams Moles Atoms/Molecules**    X Molar Mass **÷** 6.022 x1023 atoms/molecules | |
| Empirical Formula: Formula for a Hydrate   1. Calculate moles 1. Find Grams of anhydrous material and water 2. Find Ratio of moles 2. Calculate moles of each 3. Use whole number as subscripts 3. Find Ratio of moles use as multiplier | |
| **Prefixes:** 1- mono 2 – di 3- tri 4- tetra 5- penta 6- hexa 7- hepta 8- octa  **Roman Numerals:** 1 I 2 II 3 III 4 IV 5 V 6 VI 7 VII 8 VIII 9 IX 10 X  **Metric Prefixes:**  Kilo Hecta Deca Base Unit ( liters, meters, grams) Deci Centi Milli | |
| **Nomenclature:** | |
| |  |  | | --- | --- | | **Type** | **Rule**  **Naming:**  **Formula** | | **Monovalent Metal & Nonmetal** | State Metal State nonmetal change ending on nonmetal to ide.  To Make: Cross and drop oxidation numbers reduce if possible | | **Polyvalent Metal & nonmetal.** | State metal state use a roman numeral to indicate the oxidation state of the metal state nonmetal change ending to ide.  To Make: Cross and drop oxidation numbers reduce if possible | | **Nonmetal Nonmetal compounds** | Prefix to indicate the number of that type of element (subscript) state first nonmetal use prefix to state the number of the second element change ending to ide.  To Make: DO NOT CRISS CROSS use prefix as subscripts | | **Monvalent Metal & Polyatomic** | State metal sate polyatomic  Cross and drop use parenthesis if dropping a charge from the metal greater than one | | **Polyvalent metal & Polyatomic Ion** | Sate Metal a roman numeral for the oxidation state of the metal and state the name of the polyatomic ion.  To Make: Cross and drop use parenthesis if dropping a charge from the metal greater than one | | **Ammonium & Nonmetal** | change the ending of nonmetal to ide  cross and drop to make | | **Ammonium & Polyatomic** | With a polyatomic ion don’t change anything state the name  Cross and drop to make | | |
| **Stoichiometry**  **Mass🡪-Mass Mass 🡪 Gas Liters Gas Liters 🡪 Mass**   1. Convert grams to moles 1. Convert to moles 1. Solve n=PV/RT 2. Use mole ratio 2. Use mole ratio 2. Use mole ratio 3. Convert moles to grams 3. Solve L= nRT/P 3. Convert to grams   **Grams🡪 Liters of Solution Liters of Solution🡪 Grams**   1. Convert grams to moles 1. Convert volume to moles 2. Use mole ratio 2. Use mole ratio 3. Use concentration to convert moles to liters 3. Convert moles to grams | |

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