

- 1  Chemical Reactions
  - 1 or more substances combine to form new substances with new properties: Ex: NaCl
  - Bonds: Breaking & making (rearranging)
  - Trans. 254
- 2  Chemical Symbols
  - Shorthand (abbreviation) for elements:
  - Ex: O, H, Na, Fe
  - Capital letter or Capital + Lower case
- 3  Chemical Formulas
  - Shorthand for compounds
  - Formulas for molecules show exactly how many of each element
  - Covalent compounds usually nonmetals (see prefix chart p. 533)
- 4  Chemical Formulas (continued)
  - Ionic (usually metals & nonmetals) show ratio of ions in crystal lattice
  - Ex: NaCl --1 Na for every 1 Cl in compound
  - Total charges of ions in compound must be ZERO! (p. 533)
- 5  Formulas
  - $2\text{O}_2$
  - 2 = Coefficient (# of total molecules) multiplies all after it
  - O = symbol of element
  - $_2$  = subscript--how many of element directly before it
- 6  Bellwork
  - Use the chart on p.533 to write the formulas for the following:

- Sulfur trioxide
- Calcium fluoride
- Phosphorus pentachloride
- Dinitrogen trioxide ---lithium oxide
- 7  Chemical Equations
  - Shorthand for chemical reactions
  - Uses chemical symbols & formulas
  - Ex:  $C + O_2 \rightarrow CO_2$
  - Reactants   Yields   Products
- 8  Balancing Equations
  - Must be balanced
  - # & type of atoms in product must = # & type of atoms in reactant
  - Law of conservation of mass/matter: matter cannot be created nor destroyed
- 9  How to balance equations:
  - Steps (see p. 536)
  - 1. Count & list types of atoms for product & reactant
  - 2. Use coefficients balance
  - CAN ONLY CHANGE COEFFIC.
  - NEVER PUT COEF. IN MIDDLE OF A FORMULA
- 10  PRACTICE
  - TRANSP. #256
  - MATHBREAK P. 537
- 11  BELLWORK
  - WHAT IS  $Ba(Na)_2$ ?
  - Banana!:) )

- 12 ☐ Types of Chemical Reactions
- ☐ 4 Main types (p. 538 - p. 539)
  - ☐ Synthesis:  $A + B \rightarrow AB$                       2 or more combine to form larger compound
  - ☐ Decomposition:  $AB \rightarrow A + B$                       large compound breaks into smaller
- 13 ☐ Types of Reactions (cont'd)
- ☐ Single Replacement =  $AX + B \rightarrow A + BX$  (one compound regroups - more reactive)
  - ☐ Double Replacement =  $AX + BY \rightarrow AY + BX$  (trade partners in compounds - often forms precipitate or gas)
- 14 ☐ Practice
- ☐ Sec. Review p. 540
  - ☐ Cartoon chemistry
  - ☐ Fabulous Food Reactions WS
- 15 ☐ Energy & Chemical Reactions
- ☐ Reactions involve energy (light, heat, electrical) see p. 541
  - ☐ Exothermic - thermal (heat) energy is released.
  - ☐ Ex:  $2Na + Cl_2 \rightarrow 2NaCl + \text{Energy}$
- 16 ☐ Reaction Energy cont'd
- ☐ Endothermic: Absorbs energy
  - ☐ Ex: photosynthesis -
  - ☐ LAW OF CONSERVATION OF ENERGY: Not created nor destroyed (absorbed, released, stored, etc.)
- 17 ☐ Activation Energy
- ☐ Energy required to start a reaction (see graphs p. 543)
  - ☐ WS: Activation energy
- 18 ☐ Factors Influencing Reaction Rates
- ☐ Rate = Speed

Collision Theory: # of collisions = Reaction Rates

Factors:

1. Temperature: Temp. = Rate

19  Reaction Rate Factors Cont'd

2. Concentration: Concentration = rate (due to more collisions)

3. Surface Area - S.A = Rate

20  Factors (cont'd)

Catalysts (not effected by reaction) Catalysts rate by activation energy required Ex: enzymes

Inhibitors: rate of reactions Ex: preservatives

Section Rev. p. 545