

AP Chemistry Chapter 1-3 definitions!

Chapter One:

1. Matter

2. States of Matter:

Gas (When do you use the word “vapor” to describe a gas?)

liquid

solid

3. Element vs. Compound

4. The five most abundant elements in the earth’s crust are _____

5. Mixture vs. Compounds

6. Which follows the law of constant composition: mixtures or compounds? _____
Which can be physically separated, a mixture or compound? _____

7. Homogeneous/Heterogeneous (and which one of these describes a solution?)

8. Intensive properties vs. Extensive properties.. explain and give examples.

9. Physical change vs. chemical change (and what are some signs of chemical change?)

10. Describe 3 ways to separate a mixture

11. Scientific Method (obviously this will come up throughout the year...)

12. Conversions/Metric

Know how to convert between Kelvin, Celsius, and Fahrenheit

Know the boiling point and freezing point of water

Know the metric prefixes (and how to convert between them) for:

Mega, kilo, deci, centi, milli, micro, nano, and pico

Know that $1 \text{ mL} = 1 \text{ cm}^3$

Know that an Angstrom (\AA) is 10^{-10} meters.. (about the size of an atom)

Know the SI units for length, mass, temp, time, pressure, energy (meters, kilograms, Kelvin, seconds, Pascals, Joules) Know what a Joule stands for and what a Newton stands for!

13. Density

14. Precision vs. Accuracy

15. Determining the number of significant figures in a number.. when do the zeroes count as sig. figs.?

16. Rules for Sig Figs: Multiplying or dividing

17. Rules for Sig Figs: Adding or subtracting

Chapter Two :

1. Dalton's Atomic Theory...Anything wrong with point #2, according to 20th/21st century science?
2. Dalton's atomic theory.. explain his logic
3. Law of Definite Proportions: Explain and give an example
4. Law of Multiple Proportions: Explain and give an example

Regarding # 5-10, We will discuss atomic models and history, including Dalton, Thomson, Rutherford, Bohr, and the quantum mechanical model later this year.

5. Cathode Rays
6. J.J. Thomson
7. Millikan Oil Drop Expt.
8. Rutherford
 - α
 - β
 - γ
9. Thomson Model of the atom and his evidence
10. Rutherford Model of the atom and his evidence

11. Know that $1 \text{ amu} = 1.66 \times 10^{-24} \text{ grams}$.

12. What is the reciprocal of 1.66×10^{-24} ? Significance?

13. Atomic Number

14: Mass Number

15. Which two subatomic particles are called “**nucleons**”? See page 876.

16. Isotopes of the same element.. how are they the same? how are they different?

17. Mass Spectrometer (We'll discuss in class when we do quantum/history but do a brief description now)

18. Calculations involving natural abundances and atomic mass.

19. Periodic Table

Group

Family

Period

20. Know names of families 1A, 2A, 7A, 8A (1A = alkali metals.....)

21. For all of the A groups, if they form ions, what charge(s) do they typically form? Why/how?

22. Metals vs. Non Metals vs. "Metalloids"

23. Give an example of an elemental gas with: a diatomic molecule _____

a triatomic molecule _____ a monatomic molecule _____

24. Give an example of a gas compound with molecules that are diatomic _____ triatomic _____

25. Know which elements are typically diatomic... **H O F Br I N Cl !!!**

26. Ions: Cations

Anions

oxyanions (aka polyatomic anions)

27. What type of ions do metals tend to form? _____

What type of ions do nonmetals tend to form? _____

Of metals and nonmetals, which can commonly covalently bond? _____

28. Compare Ionic and Covalent Compounds:

Which type(s) of elements participate?

Are electrons lost/gained/shared.. and which type(s) of elements lose vs. gain vs. share?

Which type involves molecules?

29. Naming/Formula writing rules. Know how to name these types without your hot pink ion sheet:

Ionic Compounds

Covalent Compounds

Acids (these are covalent too, but have their own system.)

30. The Formula Weight of NaCl is 58.5 grams/mole or 58.5 amu. Why isn't this called the "molecular weight"?

Chapter Three:

1. Reactions: Know how to write and balance chemical equations (including net ionic equations) for all the types on the front of the yellow sheet: Single Replacement, Double Replacement, Combustion, Combination, Decomposition.

2. Percent composition

3. The Mole

4. Avogadro's number

5. Molar Mass..molecular weight..formula weight..g/mole.. amu (recognize the different terms and units.)

6. Know how to convert between grams, moles, molecules, atoms.

7. Empirical Formula (what is it, and how to calculate it.)

8. Combustion analysis (what is it, and how to use data to calculate empirical formula.)

9. Stoichiometry calculations.

10. Stoichiometry with limiting reactants: Be able to determine the following, if given starting amounts of two or more reactants: Which reactant is limiting? Which reactant(s) is excess?
How much (mass/moles/molecules) product can form?
How much (mass/moles/molecules) of each excess reactant will remain after the rxn?

11. Know and be able to use the formulas for percent error and percent yield.

percent error =

percent yield =

12. Hydrates: Concepts and Calculations (see page 518, "a closer look.")