

Chemistry Final Review

Module 1

1. The difference between precision and accuracy
2. Be able to do calculations with density. $\text{Density} = \text{Mass}/\text{Volume}$
3. Be able to change units
4. Write numbers in scientific notation
5. Convert numbers from scientific notation to decimal notation

Module 2

6. Understand the difference between mass and weight
7. Know the definition of work
8. Know the First Law of Thermodynamics
9. Be able to explain the difference between kinetic and potential energy
10. Understand the difference between a chemistry calorie and a food Calorie

Module 3

11. Know the difference between continuous and discontinuous theory of matter.
12. Be able to do calculations to find the masses of chemicals involved in either formation or decomposition
13. Be able to determine if an element is a metal or non-metal
14. Know that compounds that contain metals (ionic compounds) will conduct electricity when dissolved in water.
15. Be able to name ionic and covalent compounds
16. Be able to write the formula of an ionic or covalent compound if you are given the name

Module 4

17. Know the difference between an element, compound, homogenous mixture and heterogeneous mixture (the four classifications of matter)
18. Know the difference between a chemical change and a physical change
19. Understand what causes materials to change phases (solid to liquid, liquid to gas, gas to liquid, or liquid to solid)
20. Be able to balance a chemical equation

Module 5

21. Be able to classify an equation as a formation, decomposition, complete combustion or incomplete combustion reaction
22. Be able to write a balanced formation equation
23. Be able to write a balanced decomposition equation
24. Be able to calculate the mass of a molecule in amu
25. Be able to calculate the number of moles in a certain mass of molecules
26. Be able to use the coefficients of an equation to determine how many moles of one chemical will react with how many moles of another chemical

Module 6

27. Know what an empirical formula is
28. Be able to tell how many grams of one chemical will react with how many grams of another chemical if you are given the chemical equation
29. Know that the numbers in front of the chemicals in an equation are in moles not grams.
30. Know how to determine which chemical is the limiting reactant

Module 7

31. Know that opposite charges attract and like charges repel
32. Be able to determine the number of protons, neutrons and electrons in an atom
33. Be able to write the electron configuration of a given element
34. Be able to write the abbreviated electron configuration of a given element

Module 8

35. Understand the chemicals in the same column of the periodic table have similar properties
36. Know that the 8A column of the period table contains the noble gases, which have full valence orbitals
37. Know the difference between ionic and covalent bonds
38. Be able to draw Lewis structures for atoms and molecules

Module 9

39. Know why molecules are often 3-dimensional rather than just being flat
40. Be able to determine the shape of a molecule
41. Know why oil and water don't mix

Module 10

42. Know the properties of acids and bases
43. Be able to tell if an acid is diprotic or triprotic
44. Know what an indicator is
45. Be able to write a balance equation for mixing an acid and a base
46. Be able to calculate Molarity of a solution
47. Be able to use molarity to calculate the amount of a chemical that is needed in a reaction

Module 11

48. Know what solubility is
49. Know how pressure and temperature affect solubility of gases, liquids and solids
50. Be able to determine which chemical will change the boiling or freezing points the most
51. Be able to calculate molality

Module 12

52. Know which units can be used to measure pressure
53. Be able to explain how they got the Kelvin temperature scale
54. Be able to use the combined gas law to find volume, pressure or temperature of a gas
55. Be able to calculate the mole fraction of a gas

Module 13

56. Understand the difference between an exothermic and endothermic reaction
57. Be able to use a reaction time vs. potential energy graph to
 - a. determine whether a reaction is exothermic or endothermic,
 - b. determine which reaction is easiest to start
 - c. to calculate ΔH for a reaction

Module 14

58. Explain why temperature affects reaction rate

Module 15

59. Know LeChatelier's Law
60. Know the values on a pH scale and what they stand for

Module 16

61. Be able to determine the oxidation number of a compound
62. Know the difference between oxidation and reduction
63. Be able to determine whether a reaction is a redox reaction