Chemistry 101

TEST 1 STUDY GUIDE

Topic	*Text Reference*
CHAPTER 1	
• Know the steps in scientific method	1.2
• Differentiate between observation, conclusion, law and theory	1.2
• Classify matter based on its composition into mixture and pure substances	1.3
• Classify mixture into homogeneous or heterogeneous	1.3
• Classify pure substances into elements or compounds	1.3
• Differentiate between physical and chemical properties of matter	1.4
• Differentiate between physical and chemical changes	1.4
• Know the role of energy in chemical reactions and its transformation from one form to another	1.5
• Know the SI units of measurement for mass, length, and volume	1.6
• Convert between °C, °F and K	1.6
• Determine the proper number of significant digits in a measurement	1.7
• Round numbers to a specified number of significant digit	1.7
• Determine the number of significant digits in a calculated answer	1.7
• Differentiate between accuracy and precision	1.7
• Perform mathematical operations with scientific notation	Appdx 1
• Be familiar with use of square and cubic conversion factors	Notes
• Perform metric conversions involving the SI prefixes	1.8
• Perform English to metric conversions with given conversion factors	1.8
• Use dimensional analysis to solve problems involving units	1.8
• Calculate density and use to determine mass and volume	1.8
CHAPTER 2	
• Perform calculations using mass laws	2.3
• Know the key elements of the early atomic theories of Dalton, Thomson and Rutherford	2.4-2.5
• Determine number of protons, electrons and neutrons from atomic number and mass number	2.6
• Know the characteristics of an isotope	2.6
• Predict charge of main-group elements based on their position in periodic table	2.7
• Calculate the average atomic mass of atoms from isotopic data	2.8
• Relate atomic mass and relative abundance of isotopes using mass spectra	2.8
• Identify molar mass of elements from periodic table	2.9
• Perform calculations based on mass, moles and number of particles of elements	2.9

Topic	*Text Reference*
CHAPTER 3	
• Characterize the two types of bonds: ionic and covalent	3.2
• Know how ionic and covalent bonds are formed	3.2
• Differentiate between empirical, molecular and structural formulas	3.3
• Classify pure substances based on their atomic-level view	3.4
• Name and write formulas for binary ionic compounds	3.5
• Name and write formulas for ionic compounds formed from elements with multiple ionic charges	3.5
• Name and write formulas for polyatomic ionic compounds	3.5
• Name and write formulas for hydrated crystals	3.5
• Name and write formulas for binary molecular compounds	3.6
• Name and formula for binary and polyatomic acids	3.6
• Calculate formula mass and molar mass of a compound	3.8
• Convert among mass, moles and number of particles	3.8
• Determine the percent composition of elements in a compound	3.9
• Calculate mass of element in a compound using mass percent or chemical formula	3.9
• Determine empirical formula from percent composition	3.10
• Determine molecular formula from % composition and molar mass	3.10
• Determine empirical formula from combustion analysis data	3.10
• Write balanced chemical reactions from word equations	3.11
• Differentiate between organic and inorganic compounds	3.12
• Classify organic compounds into hydrocarbons and functionalized hydrocarbons	3.12
• Classify hydrocarbons into alkanes, alkenes and alkynes	3.12
• Write molecular formula for a hydrocarbon from its structural formula	3.12