**CHEMISTRY REVIEW**

| **HAPS Topic** | **Learning Outcome** | **Text** | **HTHS 1110** |
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| Atoms & molecules | 1. With respect to the structure of an atom: |  |  |
| * 1. Describe the charge, mass, and relative location of electrons, protons and neutrons. | 2.1 | Module 2 Objective 2. Describe the charge, mass, and relative location of electrons, protons, and neutrons. |
| * 1. Relate the number of electrons in an electron shell to an atom’s chemical stability and its ability to form chemical bonds. | 2.2 | Module 2 Objective 6. Relate the number of electrons in an electron shell to an atom’s chemical stability and its ability to form chemical bonds. |
| * 1. Explain how ions and isotopes are produced by changing the relative number of specific subatomic particles. | 2.1 | Module 2 Objective 5. Explain how ions and isotopes are produced by changing the relative number of specific subatomic particles. Name common polyatomic ions found in biological systems. |
| * 1. Distinguish among the terms atomic number, mass number and atomic weight. | 2.1 | Module 2 Objective 3. Define: isotope, atomic number, mass number and atomic mass (atomic weight). |
| 1. Compare and contrast the terms ions, electrolytes, free radicals, isotopes and radioisotopes. | 2.1 | Module 2 Objective 4. Define: mole, ions, electrolytes, free radicals, and radioisotopes. |
| 1. Compare and contrast the terms atoms, molecules, elements, and compounds. | 2.1 | Module 2 Objective 1. Define: atoms, molecules, elements, and compounds. |
| Chemical bonding | With respect to non-polar covalent, polar covalent, ionic and hydrogen bonds: |  | Module 2 Objective 7. Define the following bond types: covalent, polar covalent, ionic, and hydrogen. Explain the mechanism of each bond type. List each type of bond by relative strength.  Module 2 Objective 8. Give an example from biology of each of the bond types (covalent, polar covalent, ionic, and hydrogen). |
| 1. List each type of bond in order by relative strength. | 2.2 |
| 1. Explain the mechanism of each type of bond. | 2.2 |
| 1. Provide biologically significant examples of each. | 2.2 |
| Inorganic compounds & solutions | 1. Discuss the physiologically important properties of water. | 2.4 | Module 2 Objective 10. Name the properties of water that are important for an understanding of physiology. |
| 1. Distinguish among the terms solution, solute, solvent, colloid suspension, and emulsion. | 2.4 | Module 2 Objective 11. Define: solution, solute, solvent, colloid suspension, emulsion. |
| 1. Define the term salt and give examples of physiological significance. | 2.4 | Module 2 Objective 15. Explain what a salt is, and give a physiologically-significant example. |
| 1. Define the terms pH, acid, base, and buffer and give examples of physiological significance. | 2.4 | Module 2 Objective 12. Define: pH, acid, base, and buffer.  Module 2 Objective 14. Give examples of pH, acid, base, and buffer that are biologically relevant. |
| 1. State acidic, neutral, and alkaline pH values. | 2.4 | Module 2 Objective 13. Given a pH value, be able to state whether it is acidic, neutral, or basic. |