

## CHAPTER 2 THE CHEMICAL CONTEXT OF LIFE

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### OUTLINE

1. Chemical Elements and Compounds
  - a. Name elements of chemical elements (a part three and its combination called compounds)
  - b. List symbols about 20 chemical elements
2. Matter and Atoms
  - a. Atomic structure determines the behavior of an element
  - b. Atoms combine by chemical bonding to form molecules
  - c. How chemical bonds play important role in the chemistry of life
  - d. A molecule's biological function is related to its shape
  - e. Chemical reactions occur and break chemical bonds

### OBJECTIVES

After reading this chapter and studying lectures, the student should be able to:

1. Define element and compound.
2. Name four elements essential to life that make up 96% of living matter.
3. Describe the structure of an atom.
4. Define and distinguish among atomic number, mass number, atomic weight, and valence.
5. Classify the atoms, cations and anion number of an atom. Determine the number of neutrons.
6. Explain why isotopes are important to biologists.
7. Explain how electron configuration influences the chemical behavior of an atom.
8. Explain the ionic bond and predict how many bonds an atom might form.
9. Explain why the noble gases are unreactive.
10. Explain electronegativity and explain how it influences the formation of chemical bonds.
11. Distinguish among ionic, covalent polar covalent and hydrophobic bonds.
12. Describe the structure of a biological fluid and explain how it differs from a solution of ions, fluid.
13. Explain why most fluids are aqueous or fatty solutions.
14. Calculate how the relative concentrations of reactants and products affect a chemical reaction.