Chapter 2 The Chemistry of Life

Composition of Matter

(3)Matter- Elements and Atoms

1. What is matter?
2. What is the relationship between elements and atoms?
3. Describe the arrangement within energy levels of the six electrons of an atom of Carbon.
4. How are isotopes of the same element alike?
5. How can we predict which elements are reactive or unreactive under normal conditions?
6. Explain why the term weight and mass should not be used interchangeably.

(3)Compounds

1. What are the properties of Covalent Bonds?
2. What are the properties of ionic bonds?
3. How are these two bonds different?
4. Classify each of the following as an element or compound: HCl, CO2, Cl, Li, H2O, FEO
5. Given that elements are pure substances; how many types of atoms make up the structure of a single element. Explain and give an example?

Energy

(2)Energy and Matter \_states of Matter

1. Name and describe the physical properties of the three states of matter. Give information about their atoms as well.
2. Give a name to the different processes of matter changing between state phases. i.e. solid to a liquid is called…?
3. Is it possible for matter to skip phases or does matter always follow the same state phase changes? Explain and give support.
4. Is energy matter? Explain.

(3)Energy and Chemical Reactions

1. Explain the roles of reactants and products in in a chemical reaction.
2. Describe the effect of an enzyme on activation energy in a chemical reaction.
3. Enzymes are biological catalysts. Explain their role in living organisms.
4. Why does a reduction reaction always accompany an oxidation reaction?
5. Living things need a constant supply of energy. Explain why this is true.
6. Why do you suppose a reduction reaction is referred to as such, “reduction”?

Water and Solutions

(2)Polarity

1. Illustrate the structure of a water molecule by drawing a space-filling model.
2. Why is water called a polar molecule?

(3)Hydrogen Bonding

1. Identify the properties of water that are important for life to be able to exist.
2. Identify the solute and solvent in a hot chocolate solution that is made up of chocolate syrup and warm milk.
3. What is the relationship between hydrogen bonds and the forces of cohesion, adhesion and capillarity?

(4)Solutions

1. What is H30+?
2. Classify and acid and a base in regards to H30+.
3. Why does pure water have a neutral pH?
4. Outline a reason why the control of pH is important in living systems.