Name_____ Class_____ Date _____

Reviewing Key Concepts

Completion *On the lines provided, complete the following sentences.*

1. The nucleus, the center of the atom, is made up of protons and neutrons.
2. The negatively charged particles in atoms are called electrons.
3. Different isotopes of the same element have different numbers of neutrons.
4. Isotopes of the same element have the same chemical properties because they have the same number of electrons.
5. In a(an) ionic bond, electrons are transferred from one atom to another.

Short Answer *On the lines provided, answer the following questions.*

6. Describe the two main types of chemical bonds that are found in compounds.
ionic - transfer electrons
covalent - share electrons

7. Explain how an atom becomes an ion.
By losing or gaining electrons

Reviewing Key Skills

8. **Comparing and Contrasting** What are the similarities and differences between electrons and protons?
both subatomic particles
p - pos. large e - neg. small

9. **Applying Concepts** What is the relationship between atoms and molecules?
atoms are the smallest unit of matter & make up molecules
molecule is the smallest unit of most compounds

10. **Inferring** What property of radioactive isotopes allows them to be used to determine the age of rocks and fossils?
unstable nuclei

Name_____ Class_____ Date _____

Reviewing Key Concepts

Matching *Match each term with its appropriate description. Write the letter of the correct term on the lines provided. A term may be used more than once.*

a. polarity b. acidic c. basic

A 1. unequal sharing of electrons

B 2. lemon juice, pH 1.5

C 3. lower concentrations of H^+ ions than pure water

C 4. ammonia, pH 11.5

A 5. a slight negative charge at one end of a molecule, a slight positive charge at the other end

B 6. pH values that are below 7

C 7. alkaline solutions

Short Answer *On the lines provided, answer the following questions.*

8. What causes polarity in a water molecule?

unequal sharing of electrons btw H + O atoms

9. What determines whether a solution is acidic or basic?

H^+ ions

10. What is the relationship between cohesion and capillary action?

Cohesion = water attraction to itself

Capillary action = water's cohesion but as strong as adhesion to wall

11. Name two types of mixtures and describe how they are different.

Solution - all components are equally distributed

suspension - has non dissolved materials

Reviewing Key Skills

12. **Applying Concepts** What is the relationship between a base and a basic solution?

Base - compound which produces OH^- ions in solution

Basic solution - contain lower concentrations of H^+ ions than pure water

13. **Comparing and Contrasting** Describe how acidic solutions differ from pure water.

More H^+ ions

14. **Applying Concepts** What are buffers and why are they important to cells?

weak acids & bases to prevent sharp increases & decreases in pH

Name_____ Class_____ Date _____

Reviewing Key Concepts

Identifying *On the lines provided, identify each statement as describing* carbohydrates, lipids, nucleic acids, *or* proteins.

C 1. the main source of energy for living things

P 2. help carry out chemical reactions

L 3. important parts of biological membranes

N 4. contain hydrogen, oxygen, nitrogen, phosphorus, and carbon

P 5. transport substances in and out of cells

P 6. composed of amino acids

C 7. sugar and starches

N 8. store and transmit hereditary information

Completion *On the lines provided, complete the following sentences.*

9. Lipids are made up of fatty acids and glycerol.

10. Glucose, galactose, and fructose are carbohydrates called monosaccharides.

11. The two basic kinds of nucleic acids are RNA and DNA.

12. Proteins are polymers of amino acids.

13. A fatty acid with the maximum number of hydrogen atoms possible is saturated.

Reviewing Key Skills

14. **Applying Concepts** No other element can form the amount and variety of molecules that carbon can form. What characteristics does carbon have that explain this characteristic?

4 valence e⁻

15. **Comparing and Contrasting** Plastics are synthetic, organic polymers. How are plastics similar to polysaccharides? How are they different?

monosaccharides = polysaccharides both made up of carbon = Plastics smaller parts

diff-Synthetic

Name _____ Class _____ Date _____

Reviewing Key Concepts

Completion *On the lines provided, complete the following sentences.*

1. Chemical reactions that release energy often occur spontaneously.
2. During a chemical reaction, chemical bonds are broken.
3. Biological catalysts, or enzymes, act by lowering the activation energy required for a reaction.
4. The reactants of an enzyme-catalyzed reaction are known as substrates.

Defining Terms *On the lines provided, describe how the words in each set are related.*

5. catalyst, enzyme, activation energy

enzyme is a catalyst in biological substances + both lower AE

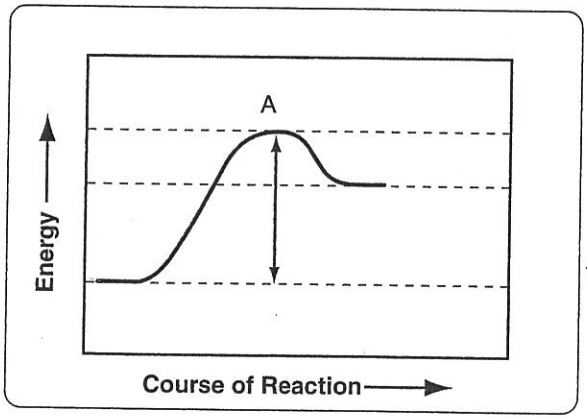
6. reactant, product, chemical reaction

reactants go thru a chem reaction + form products

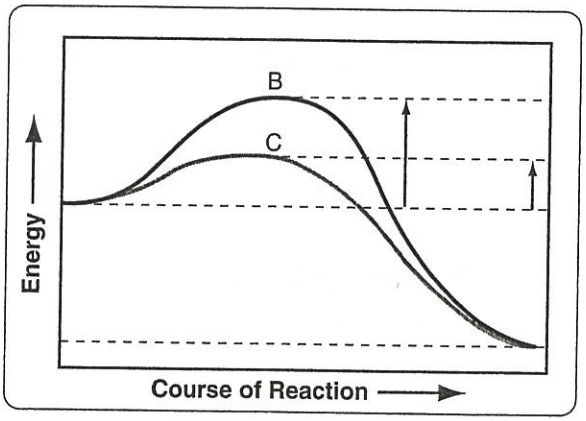
Reviewing Key Skills

Interpreting Graphics *Use the two diagrams of chemical reactions to answer questions 7 to 9.*

Graph I



Graph II



7. Which pathway has the greatest activation energy?

Graph I, ~~Graph II B~~

8. Which graph shows a reaction that absorbs energy?

Graph I

9. Why are two pathways shown in the graph on the right?

with + without enzyme

10. **Forming a Hypothesis** Most enzymes in the human body work best at 37°C. Imagine scientists have discovered an enzyme in the body that works best at 39°C. What processes or functions might this enzyme be involved in?

Enzymes needed in immune system for infection

Name_____ Class_____ Date_____

Completion *On the lines provided, complete the following sentences.*

1. Protons and neutrons together form the ~~Atomic mass~~ nucleus, which is at the center of the atom.
2. A pure substance that consists entirely of one type of atom is called a(an) element.
3. A chemical compound is a substance formed by the combination of two or more elements in definite proportions.
4. The two main types of chemical bonds are ionic and covalent.
5. The slight attractions that develop between the oppositely charged regions of nearby molecules are called van der Waals forces.

Short Answer *On the lines provided, answer the following questions.*

6. How do a sodium atom and a positive sodium ion differ?
   Sodium atom has 11 electrons. Pos. ion has lost electrons
7. How do cohesion and adhesion differ?
   C - same sub attraction
   a - diff " "
8. In a salt solution, why is water the solvent and salt the solute?
   water breaks down the salt
9. How do acids and bases differ?
   acids make H^+
   bases make OH^-
10. Describe the roles of a catalyst and a substrate in a chemical reaction.
    Substrates = reactants so they enter into the reaction.
    catalyst can speed up the reaction

Name_____ Class_____ Date _____

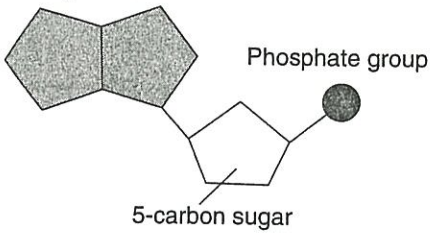
Matching *On the lines provided, write the letter of the definition that best matches each term.*

C 11. polymer
E 12. amino acid
G 13. monosaccharide
A 14. isotopes
B 15. buffer
H 16. nucleic acid
D 17. enzyme
F 18. chemical reaction
I 19. lipid

a. atoms of the same element that differ in the number of neutrons
b. weak acid or base that prevents sharp swings in pH
c. large compound formed by the joining of small compounds, called monomers
d. catalyst that speeds up chemical reactions in cells
e. monomer of a protein
f. process that produces a new set of chemicals
g. single sugar molecule
h. polymer assembled from nucleotides
i. common categories are fats, oils, and waxes

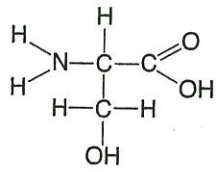
Labeling Diagrams *For questions 20 and 21, identify the diagram as one of the following:* nucleotide or amino acid. *Place your answer on the lines provided below each diagram.*

20. Nitrogenous base



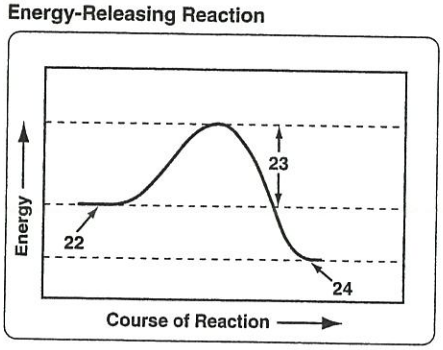
nucleotide

21.



amino acid

Labeling Diagrams *On the lines provided, label the parts of the reaction as one of the following:* products, reactants, *or* activation energy.



22. reactants
23. activation energy
24. products