Name Date Class

Chapter Review (continued)

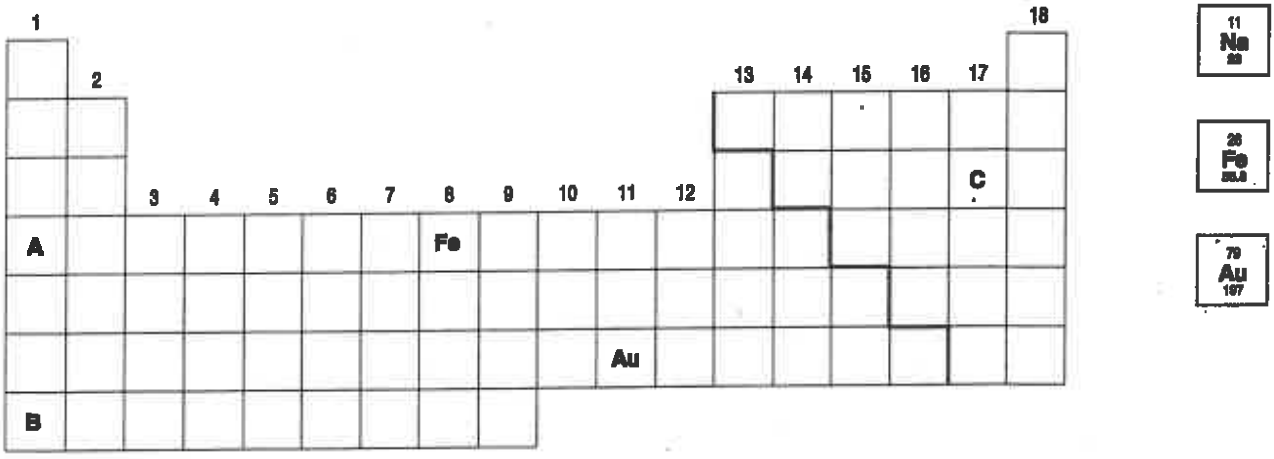
CHAPTER 16.2 REVIEW

Part B. Concept Review

Directions: *Complete the table below by writing the correct information in the blank spaces.*

Element	Chemical symbol	Atomic number	Number of protons	Number of neutrons	Mass number
1. Sodium		11	11	12	23
2. Carbon	C		6	6	12
3.	Fe	26	26	30	56
4. Sulfur	S	16		16	32
5. Nitrogen	N	7	7		14
6. Oxygen	O	8	8	8	
7.	He	2	2	2	4
8. Chlorine-35	Cl	17	17		35
9. Copper	Cu	29	29	35	
10. Chlorine-37	Cl		17	20	37

Directions: *Refer to the periodic table below and the boxes at the right of the table to answer questions 11–15.*



_____ 11. Which element has a greater atomic mass, A or B?

_____ 12. Which element is a metal, B or C?

_____ 13. In which group is gold?

_____ 14. What is the average atomic mass of iron?

_____ 15. What is the atomic number of sodium?

Name _____ Date _____ Class _____

Directed Reading for Content Mastery

Section 1 • Structure of the Atom
Section 2 • Masses of Atoms

Directions: *Use the terms below to complete the following paragraphs about atoms, atomic mass, and isotopes. Terms may be used more than once.*

six	**number**	**electrons**	**isotopes**	**electron cloud**
neutron(s)	**proton(s)**	**mass**	**quarks**	**six protons**

The electron has very little mass compared to the 1. _____ or 2. _____. The mass of the atom depends on the nucleus and how many 3. _____ and 4. _____ it has. The sum of the protons and neutrons is the mass 5. _____ of an atom. The number of neutrons in an atom can be found by subtracting the atomic number from the 6. _____ number. The mass of the atom is so small that there is a measure called the atomic 7. _____ unit designated by amu. 8. _____ and 9. _____ make up the nucleus and are made up of 10. _____. There are 11. _____ uniquely different quarks. 12. _____ are found in an area around the nucleus called the 13. _____. The nuclei of all atoms of a given element always have the same number of 14. _____. They will also have the same number of 15. _____ around the nucleus. Some atoms may have more or fewer 16. _____ than will other atoms of the same element. Atoms of the same element with different numbers of neutrons are called 17. _____. Every atom of carbon must contain 18. _____ but some contain six neutrons and others have eight neutrons.

Isotopes in Dating Methods

Geologists use some elements' half-lives to determine the ages of rocks and fossils. Carbon isotope dating is used to date objects between 1000 and 60 000 years old. Earth's age is thought to be about 4.5 billion years. Fill in the chart to show the ratio of a radioisotope to its decay product after three half-lives.

1. Would carbon be used in dating moon rocks, which are nearly as old as Earth? Why or why not?

_____

_____

Radioisotopes and Their Decay Products

Isotope	Half-life	Decays to
rubidium–87		
potassium–40		
carbon–14	5730 years	carbon–12

2. Potassium-40 decays into the isotope argon-40 with a half-life of about 1.3 billion years. Add this information to the table above. Potassium is also a common element in Earth's crust. The argon decay product is trapped in the rock. Why would this element be useful for dating rocks formed during ancient Earth events?

_____

_____

_____

3. If a rock sample is found to contain potassium-40 and argon-40 in the proportion 1:1, how old would it be?

_____

4. Suppose a rock sample is 2.6 billion years old. If there were 20 grams of potassium-40 at the time the rock formed, how much argon-40 would the sample contain? What proportion of potassium-40 to argon-40 would the rock contain?

_____

_____

_____

_____

5. Rubidium-87 decays to strontium-87 with a half-life of 49 billion years. Add this information to the table. Why might this isotope and its decay product be less useful for dating than potassium-40 and argon-40?

_____

ATOMIC STRUCTURE

_____ are made up of only one kind of atom.

_____ = the number of protons in the nucleus.

_____ = the # of protons and neutrons in the nucleus.

neutrons = mass # - atomic # (rounded off to the nearest whole #)

Subatomic Particles:

Complete the following chart:

Particle	Location	Mass (amu)	Charge
Proton			
Electron			
Neutron			

Find the Missing Numbers

Use your knowledge of atomic number and mass number to fill in the missing numbers:

Element	Atomic #	Mass #	HOW MANY?		
			Protons	Neutrons	Electrons
Iron					
Sulfur					
Carbon					
Fluorine					
Calcium					
Nitrogen					
Copper					
Sodium					
Mercury					
Silver					