Class

EVALUATION

CHAPTER 10

PERIODIC PROPERTIES

Write the	letter of the term or phr	rase that completes the	statement or answers the	e question.
1	Which of the following a. atomic mass b. atomic radius	g is the most important	factor in determining the c. periodic table posi d. electron configurat	
2	. Similar properties for these properties are re a. intensive		r at certain intervals of c. extensive	atomic number. Therefore d. intermittent
3	. As the principal quant a. increases	tum number increases the b. decreases	ne size of the electron cl c. remains constant	oud d. varies at random
4	. As you look across a p	period from left to right b. decreases	in the periodic table the c. remains constant	size of the atoms d. varies at random
5	. In which of the follow radius? a. Ni, K	wing pairs of particles b. Na, Cs	does the second particl	e listed have the smaller
6				emically stable particle? d¹º4p ⁶
7	. What is the oxidation a. 2+	number of an element le b. 3+	ocated in period three an	nd Group 16? d. 2–
8	a. first ionization energy b. energy of formation	gy	nost loosely held electron c. bonding energy d. activation energy	n from an atom is the
9	. Phosphorus has a first elements has a first ion a. F	ionization energy of 10 nization energy less than b. Ga	11.8 kilojoules per mole n that of phosphorus? c. N	e. Which of the following
10	. Which of the following a. nuclear charge	g is not a factor that affe b. shielding effect	ects ionization energy? c. electron spin	d. atomic radius
11	As you move through a increases	a period from metals to b. decreases	nonmetals the first ioniz	zation energy d. varies at random
12	. The variations in the p	attern of ionization ene	rgies as you move acros	s a period is the result of
	a. increasing nuclear of b. the s and p subleve	0	c. the shielding effect d. decreasing atomic v	
13	For each subsequent el a. increases	ectron removed from an b. decreases	a atom the ionization end c. remains the same	ergy required d. varies at random
14.	A measure of the attractal a. multiple ionization b. electronegativity	ction of an atom for add energies	itional electrons is refer c. electron affinity d. combining capacity	
CIII	•			

	_ 15.	In general, as electron	affinity increases ioniz	ation energy				
		a. increases	b. decreases	c. remains constant	d. varies at random			
	_ 16.	As you move down th	rough a column or grou	p electron affinity				
		a. increases		 c. remains constant 				
		b. decreases		d. increases then deci	reases)		
	_ 17.	If two elements have	similar chemical propert	ties you would expect th	nem to have			
		 a. similar atomic radi 	i	 c. the same number of 	f outer electrons			
		b. the same number of	of energy levels	d. similar atomic mas	sses			
	_ 18.	18. Which of the following has the greatest impact on the atomic radius as you move down through group?						
a. increased size of the principal quantum number								
		b. increased nuclear of c. increased atomic m						
		d. increased electron						
	19. Which of the following describes the size of the ions of the elements as you move from lef right across a period in the periodic table?							
		a. increases	if the periodic table:	c. remains constant				
		b. decreases		d. decreases, then inc	reases			
-	_ 20.	In which of the follow a. Rb, Y	ing pairs of particles doe b. Br, F	es the second particle list c. S^{2-} , S	ted have the larger radius? d. Ga³+, As³-			
	_ 21.	Elements in the same gistics in common?	group or family in the pe	riodic table have which o	of the following character-			
			um number of the outer	energy level				
		b. the number of isoto	pes that exist for that el	lement				
		c. the size of the atom				1		
		d. the number of elect	trons in the outer energy	y level		1		
22. Which of the following occurs when an elemtion?				ent in Group 2 attains a	stable electron configura-			
		a. gain 2 electrons	b. lose 2 electrons	c. gain 6 electrons	d. gain 8 electrons			
	23.	What is the oxidation	number of an element in	n Period 4 and Group 13	1?			
		a. 3+	b. 3-	C. 4+	d. 1-			
	24	The first ionization en	nergy of calcium is 590	0 0 kilojoulos por molo	Which of the following			
		elements has a first ion	nization energy greater t	han that of calcium?	which of the following			
		a. K	b. Rb	C. Sr	d. Mg			
25. The electron configuration of boron is 1s ² 2s ² 2p ¹ . As electrons a boron the greatest jump in ionization energy would occur betwee electrons?					noved consecutively from nich of the following two			
		a. first and second	b. second and third	c. third and fourth	d. fourth and fifth			
	26.	If an element has a hig	th ionization energy its	electron affinity would b				
	20.	a. high	b. low	c. zero	d. unpredictable			
		-	tion of K+ is most simil					
		a. K	b. Na ⁺	c. Ar	d. Ca ⁺²			
<u></u>		The radii of the atoms primarily a result of		dium to chlorine across l	Period 3. This decrease is	a		
		a. the shielding effectb. increased nuclear c		c. the increased numb d. decreased metallic		6		

REVIEW

PROBLEMS

1. Refer to a table of atomic and ionic radii, if necessary.

a. Within a period, does the size of the atom increase or decrease with increasing atomic number?

_ b. Within a family, does the size of the atom increase or decrease with increasing atomic number?

c. When metallic atoms lose electrons do they form smaller or larger

d. When nonmetallic atoms gain electrons do they form smaller or

larger ions? 2. From each of the following pairs, circle the larger particle.

Br I

F F-

Cs

K+ K

Ne Ar

3. Predict the oxidation number, given the electron configurations for the following neutral atoms.

Oxidation Number Element Configuration $1s^22s^22p^63s^2$ 1s²2s²2p⁶3s¹ В $1s^22s^22p^6$ C $1s^22s^22p^5$ D $1s^22s^22p^1$ Ε

4. Write the correct empirical formula for each of the following combinations of elements from Question

3. (If no reaction, write none.)

____ a. B and D

____ b. E and D

____ c. A and D

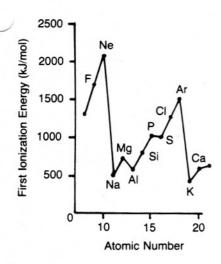
____ d. A and C

5. Complete each of the following statements.

a. The of an element is determined experimentally by bom	abard-
ment of atoms in the vapor phase with a stream of electrons.	

- b. The energy necessary to completely remove the most loosely held electron from an atom is called the _____ ionization energy.
- __ c. A low ionization energy is characteristic of a ____.
- _____ d. As a trend on the periodic table, ionization energies ____ across rows or periods.
- e. As a trend on the periodic table, ionization energies ____ down columns or groups.
 - _____ f. An element with a high ionization energy is classified as a ____.
 - g. The attraction an atom has for its outer electrons is called ____.
 - h. An element having a low electron affinity is classified as a
 - ___ i. Nonmetals have ___ electron affinities.

6. Factors affecting ionization energy include nuclear charge, the shielding effect, the atomic radius, and the electron arrangement in a sublevel. Use the appropriate factors to explain the peaks in the graph between sodium, Na, and argon, Ar.



7. Underline the atom in each of the following pairs that has the lower first ionization energy.

a. Li Na

b. Kr Rb

c. Cs Ba

d. Cl Br

e. F Ne

f. S Cl