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**NTI Day 5 Assignment**

**Lesson 5 Review**

**Content Standard: Periodic Trends**

**Class: Chemistry    Teacher: K. Kelly**

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1. Atoms that have the same number of outer electrons

- A. belong to the same family of elements.
  - B. are all nonmetallic elements.
  - C. are all metallic elements.
  - D. must be atoms of the same element.
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2. Which group on the periodic table is least likely to be involved in a chemical reaction?

- A. group 1
  - B. group 17
  - C. group 13
  - D. group 18
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3. The periodic table consists of elements following a repeating pattern of

- A. outermost electrons.
  - B. excess neutrons.
  - C. hydrogen ions.
  - D. nuclei.
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4.

1 H 1.01	2 He 4.00																
3 Li 6.94	4 Be 9.01	5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18										
11 Na 22.99	12 Mg 24.31	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95										
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
55 Cs 132.9	56 Ba 137.3	71 Lu 175.0	72 Hf 178.5	73 Ta 181.0	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po 209.0	85 At 210.0	86 Rn 222.0
87 Fr 223.0	88 Ra 226.0	103 Lr 262.1	104 Rf 261.1	105 Db 262.1	106 Sg 263.1	107 Bh 264.1	108 Hs 265.1	109 Mt 268.0	110 Ds 269.0	111 Rg 272.0	112 Cn 277.0	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	

  

57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm 144.9	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0
89 Ac 227.0	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np 237.1	94 Pu 244.1	95 Am 243.1	96 Cm 247.1	97 Bk 247.1	98 Cf 251.1	99 Es 252.1	100 Fm 257.1	101 Md 258.1	102 No 259.1

A metal in group 17 of the periodic table can become a chemically stable ion by

- A. gaining one electron.
  - B. losing one electron.
  - C. losing two electrons.
  - D. gaining two electrons.
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5. A particular element has the following set of properties:

- It has a low melting point.
- It has a low boiling point
- It exists as a two-atom molecule in the gas phase.
- It has seven outer electrons.
- It readily reacts with metals to produce a salt.

Which element does the list describe?

- A. hydrogen (H)
  - B. barium (Ba)
  - C. xenon (Xe)
  - D. iodine (I)
-

6. The reactivity of elements can be predicted based on the position of an element in the periodic table. Based on the periodic table, which of the following elements would be expected to be the least reactive?

- A. bromine (Br)
  - B. fluorine (F)
  - C. iodine (I)
  - D. chlorine (Cl)
- 

7. Based on its position in the periodic table, which of the following elements would be expected to be more reactive than phosphorus (P)?

- A. sulfur (S)
  - B. zinc (Zn)
  - C. argon (Ar)
  - D. silicon (Si)
- 

8. Ionization energy is the amount of energy required to remove an electron from a neutral atom. The first ionization energy is the energy required to remove only the first of the outermost electrons. The first ionization energies of several elements are given in the table below.

Element	Atomic Number	First Ionization Energy (eV)
Se	34	9.752
Br	35	11.814
Kr	36	13.999
Rb	37	4.177
Sr	38	5.695

Which of the following statements best explains the differences in first ionization energies between krypton and rubidium?

- A. Rubidium's nuclear charge is smaller than krypton's.
  - B. The distance from the nucleus to the outermost electron is smaller in krypton than it is in rubidium.
  - C. The distance from the nucleus to the outermost electron is greater in krypton than it is in rubidium.
  - D. Rubidium's nuclear charge is greater than krypton's.
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9. The noble gases include helium, neon, argon, krypton, xenon, and radon. What property do these elements share?

- A. They were discovered in ancient times.
  - B. They are never found in the Earth's atmosphere.
  - C. They are normally unreactive with other elements.
  - D. They readily form compounds with other elements.
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10. Which of the following elements has the highest electronegativity?

- A. fluorine (F)
  - B. chlorine (Cl)
  - C. sulfur (S)
  - D. oxygen (O)
- 

11. Electrons always fill orbitals in the same order. Each  $s$  orbital holds 2 electrons, each set of  $p$  orbitals holds 6 electrons, each set of  $d$  orbitals holds 10 electrons, and each set of  $f$  orbitals holds 14 electrons. The order in which orbitals are filled, from first to last, is:

1s 2s 2p 3s 3p 4s 3d 4p 5s 4d 5p 6s 4f 5d 6p 7s 5f 6d 7p

Nitrogen has 7 electrons. What is the electron configuration of nitrogen?

- A.  $1s^1 2s^1 2p^1 3s^1 3p^3$
  - B.  $1s^2 2s^2 2p^3$
  - C.  $1s^2 2s^2 2p^2 3s^1$
  - D.  $1s^2 2s^2 3s^2 3p^1$
- 

12. Which statement accurately describes the elements within Group 17 of the periodic table?

- A. They all have the same number of electrons.
  - B. They all have similar chemical properties.
  - C. They all have low electronegativity.
  - D. They all have small atomic radii.
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**13.** Fluorine is an element with atomic number 9. It is located in group 17 on the periodic table and has 7 electrons in its outermost energy level. Calcium is an element with atomic number 20. It is located in group 2 on the periodic table and normally has 2 electrons in its outermost energy level. Fluorine has a tendency to gain electrons during chemical reactions, and calcium has a tendency to lose electrons during chemical reactions.

What is primarily responsible for the elements' different chemical responses?

- A.** the position of their protons and neutrons
  - B.** the speed at which the electrons travel around the nucleus
  - C.** the number of electrons in their outermost energy levels
  - D.** their states of matter
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**14.** Which element is the most reactive out of the list below?

- A.** helium
  - B.** iron
  - C.** nickel
  - D.** chlorine
- 

**15.** Which of the following elements most readily accepts electrons?

- A.** phosphorus
  - B.** sulfur
  - C.** silicon
  - D.** chlorine
- 

**16.** Which element shares the most characteristics with fluorine (F)?

- A.** bromine (Br)
  - B.** oxygen (O)
  - C.** chlorine (Cl)
  - D.** neon (Ne)
- 

**17.** Which of the following properties is true for any period within the periodic table?

- A.** All the elements have empty *p* shells.
  - B.** All the elements are alkali metals.
  - C.** The number of electrons increases from left to right.
  - D.** The number of electron shells increases from right to left.
-

18. Which of the following increases as you move up a column of the periodic table?

- A. atomic radius
- B. electronegativity
- C. number of electrons
- D. atomic number

19. The periodic table is organized in a way that shows many general trends, including chemical reactivity, which is the likelihood that an element will react with other substances.

On the table below, metals are colored in blue and nonmetals are colored in red. For metals, reactivity increases moving from right to left and from top to bottom across the table.

The noble gases are unreactive, but for the other nonmetals, reactivity decreases moving from right to left and from top to bottom across the table.

												13	14	15	16	17	18		
1	1																	2	
	<b>H</b>																	<b>He</b>	
2	3	4											5	6	7	8	9	10	
	<b>Li</b>	<b>Be</b>											<b>B</b>	<b>C</b>	<b>N</b>	<b>O</b>	<b>F</b>	<b>Ne</b>	
3	11	12	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	<b>Na</b>	<b>Mg</b>											<b>Al</b>	<b>Si</b>	<b>P</b>	<b>S</b>	<b>Cl</b>	<b>Ar</b>	
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
	<b>K</b>	<b>Ca</b>	<b>Sc</b>	<b>Ti</b>	<b>V</b>	<b>Cr</b>	<b>Mn</b>	<b>Fe</b>	<b>Co</b>	<b>Ni</b>	<b>Cu</b>	<b>Zn</b>	<b>Ga</b>	<b>Ge</b>	<b>As</b>	<b>Se</b>	<b>Br</b>	<b>Kr</b>	
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
	<b>Rb</b>	<b>Sr</b>	<b>Y</b>	<b>Zr</b>	<b>Nb</b>	<b>Mo</b>	<b>Tc</b>	<b>Ru</b>	<b>Rh</b>	<b>Pd</b>	<b>Ag</b>	<b>Cd</b>	<b>In</b>	<b>Sn</b>	<b>Sb</b>	<b>Te</b>	<b>I</b>	<b>Xe</b>	
6	55	56	*	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	
	<b>Cs</b>	<b>Ba</b>		<b>Hf</b>	<b>Ta</b>	<b>W</b>	<b>Re</b>	<b>Os</b>	<b>Ir</b>	<b>Pt</b>	<b>Au</b>	<b>Hg</b>	<b>Tl</b>	<b>Pb</b>	<b>Bi</b>	<b>Po</b>	<b>At</b>	<b>Rn</b>	
7	87	88	**	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	
	<b>Fr</b>	<b>Ra</b>		<b>Rf</b>	<b>Db</b>	<b>Sg</b>	<b>Bh</b>	<b>Hs</b>	<b>Mt</b>	<b>Ds</b>	<b>Rg</b>	<b>Cn</b>	<b>Nh</b>	<b>Fl</b>	<b>Mc</b>	<b>Lv</b>	<b>Ts</b>	<b>Og</b>	
			*	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	
				<b>La</b>	<b>Ce</b>	<b>Pr</b>	<b>Nd</b>	<b>Pm</b>	<b>Sm</b>	<b>Eu</b>	<b>Gd</b>	<b>Tb</b>	<b>Dy</b>	<b>Ho</b>	<b>Er</b>	<b>Tm</b>	<b>Yb</b>	<b>Lu</b>	
			**	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	
				<b>Ac</b>	<b>Th</b>	<b>Pa</b>	<b>U</b>	<b>Np</b>	<b>Pu</b>	<b>Am</b>	<b>Cm</b>	<b>Bk</b>	<b>Cf</b>	<b>Es</b>	<b>Fm</b>	<b>Md</b>	<b>No</b>	<b>Lr</b>	

Which of the following elements is the most reactive?

- A. N
- B. F
- C. C
- D. B

20. The periodic table is shown below.

1 H																	2 He						
3 Li	4 Be	metal		metalloid		nonmetal		unknown		5 B	6 C	7 N	8 O	9 F	10 Ne								
11 Na	12 Mg																	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr						
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe						
55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn						
87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og						
		*	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu						
		**	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr						

Based on the periodic table, which of the following groups of elements should have very different chemical properties?

- A. beryllium (Be), magnesium (Mg), calcium (Ca)
- B. potassium (K), aluminum (Al), neon (Ne)
- C. helium (He), neon (Ne), argon (Ar)
- D. lithium (Li), sodium (Na), potassium (K)
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