Name _____ Class _____ Date _____

Assessment

Chapter Test A

Chapter: The Periodic Law

Use the periodic table below to answer the questions in this Chapter Test.

	E												E				F	G
A	1 H Hydrogen 1.01																	2 He Helium 4.00
	B	C					D											
2	3 Li Lithium 6.94	4 Be Beryllium 9.01											5 B Boron 10.81	6 C Carbon 12.01	7 N Nitrogen 14.01	8 O Oxygen 16.00	9 F Fluorine 19.00	10 Ne Neon 20.18
3	11 Na Sodium 22.99	12 Mg Magnesium 24.30											13 Al Aluminum 26.98	14 Si Silicon 28.09	15 P Phosphorus 30.97	16 S Sulfur 32.07	17 Cl Chlorine 35.45	18 Ar Argon 39.95
4	19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.88	23 V Vanadium 50.94	24 Cr Chromium 52.00	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium 97.91	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29
6	55 Cs Cesium 132.90	56 Ba Barium 137.33	57 La Lanthanum 138.91	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.84	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.2†	83 Bi Bismuth 208.98	84 Po Polonium 208.98	85 At Astatine 209.99	86 Rn Radon 222.02
7	87 Fr Francium 223.02	88 Ra Radium 226.02	89 Ac Actinium 227.03	104 261.11	105 262.11	106 263.12	107 262.12	108	109									

H	58 Ce Cerium 140.12	59 Pr Praseodymium 141.91	60 Nd Neodymium 144.24	61 Pm Promethium 144.91	62 Sm Samarium 150.36	63 Eu Europium 151.97	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97
	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.05	93 Np Neptunium 237.05	94 Pu Plutonium 244.06	95 Am Americium 243.06	96 Cm Curium 247.07	97 Bk Berkelium 247.07	98 Cf Californium 251.08	99 Es Einsteinium 252.08	100 Fm Fermium 257.10	101 Md Mendelevium 258.10	102 No Nobelium 259.10	103 Lr Lawrencium 262.11

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

_____ **1.** Mendeleev organized the chemical elements based on their
- **a.** symbols.
- **b.** properties.
- **c.** atomic numbers.
- **d.** charges.

_____ **2.** A horizontal row in the periodic table is called a(n)
- **a.** family.
- **b.** group.
- **c.** octet.
- **d.** period.

_____ **3.** The periodic law states that
- **a.** no two electrons with the same spin can be found in the same place in an atom.
- **b.** the physical and chemical properties of the elements are functions of their atomic number.
- **c.** wave patterns repeat at regular intervals.
- **d.** the chemical properties of elements can be grouped according to periodicity.

_____ **4.** An element with the general electron configuration ns^2np^1 for its outermost electrons would be in Group
- **a.** 2.
- **b.** 13.
- **c.** 14.
- **d.** 15.

_____ **5.** When a carbon atom is in its ground state, how many electrons does it have in its outermost shell?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4

_____ **6.** Which of the following elements is most similar in behavior to calcium?
- **a.** magnesium
- **b.** sodium
- **c.** sulfur
- **d.** chlorine

_____ **7.** Which periodic group or family of elements is *not* correctly matched with its common family name?
- **a.** Group 2: alkaline-earth metals
- **b.** Group 3: alkali metals
- **c.** Group 17: halogens
- **d.** Group 18: noble gases

_____ **8.** The electron configurations of main-group elements end in
- **a.** d and f orbitals.
- **b.** s and p orbitals.
- **c.** s and d orbitals.
- **d.** p and d orbitals.

_____ **9.** Which of the following elements is a transition metal?
- **a.** calcium
- **b.** iron
- **c.** sodium
- **d.** sulfur

_____**10.** All the alkali metal elements are found on the periodic table in
- **a.** Group 1.
- **b.** Group 2.
- **c.** Period 1.
- **d.** Period 2.

_____**11.** A measure of the ability of an atom in a chemical compound to attract electrons from another atom in the compound is called
- **a.** electron affinity.
- **b.** electron configuration.
- **c.** electronegativity.
- **d.** ionization potential.

_____**12.** Which of the following elements has the greatest atomic radius?
- **a.** Al
- **b.** S
- **c.** Si
- **d.** C

_____**13.** Which of the following elements has the lowest electronegativity?
- **a.** C
- **b.** F
- **c.** Li
- **d.** O

_____**14.** Which of the following elements has the greatest ionization energy?
- **a.** Ga
- **b.** K
- **c.** Bi
- **d.** As

_____**15.** Which of the following elements has an electron affinity of 0 kJ/m?
- **a.** Br
- **b.** As
- **c.** Ar
- **d.** I

_____**16.** Which of the following elements have full outer energy levels when they are in the ground state?
a. alkali metals
b. noble gases
c. halogens
d. transition metals

_____**17.** In which period is an element that has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^1$ when it is in its ground state?
a. Period 1
b. Period 2
c. Period 3
d. Period 4

_____**18.** Which of the following elements is *not* a metal?
a. H
b. K
c. Na
d. Fr

_____**19.** For atoms of *p*-block elements, the total number of electrons in the highest occupied level is equal to the
a. period number.
b. group number.
c. period number minus 10.
d. group number minus 10.

_____**20.** As electrons add to *s* and *p* sublevels in the same main energy level, they are pulled closer to the more highly charged nucleus, causing
a. the electron cloud around the nucleus to expand.
b. atoms to lose electrons more easily.
c. atomic radii to decrease in size.
d. a noble gas configuration.

_____**21.** Which electron configuration would result in the largest negative electron affinity?
a. $[He]2s^1$
b. $[He]2s^2 2p^2$
c. $[He]2s^2 2p^3$
d. $[He]2s^2 2p^5$

_____**22.** In forming an ion, from which sublevel would an atom of nickel lose electrons first?
a. $4s$
b. $3d$
c. $3p$
d. $3s$

_____**23.** Which one of the following groups contains atoms that, in compounds, have the lowest attraction for electrons?

a. Group 1
b. Group 2
c. Group 16
d. Group 17

_____**24.** Which ionization energy is generally the largest?

a. first ionization energy
b. second ionization energy
c. third ionization energy
d. fourth ionization energy

_____**25.** The metalloids are located on the periodic table between

a. halogens and noble gases.
b. nonmetals and metals.
c. alkaline-earth metals and other metals.
d. alkali metals and transition metals.