Name: _____
Regents Chemistry Chapter 4 Pre-Test

1) Which element has chemical properties that are *most* similar to the chemical properties of sodium?
A) Se B) Cl C) Mg D) K

2) Which list of elements contains two metalloids?
A) Po, Sb, I, Xe B) As, Bi, Br, Kr C) Si, P, S, Cl D) Si, Ge, Po, Pb

3) Which of the following elements has the *highest* electronegativity?
A) Ca B) Al C) K D) H

4) Which element is a noble gas?
A) manganese B) chlorine C) krypton D) antimony

5) After a neutral sulfur atom gains two electrons, what is the resulting charge of the ion?

6) Which is a property of *most* nonmetallic solids?
A) high thermal conductivity
B) brittleness
C) malleability
D) high electrical conductivity

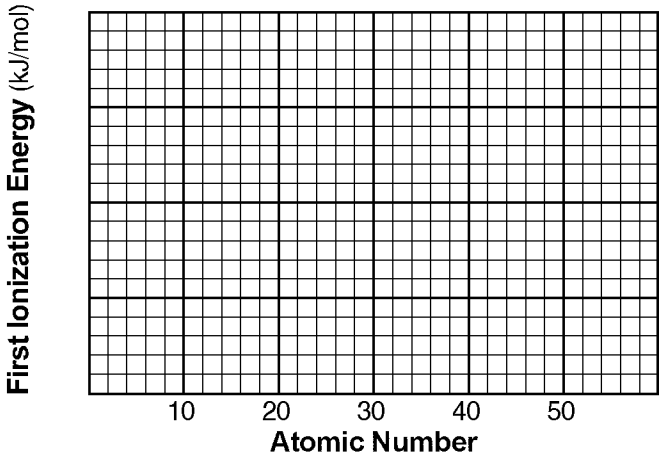
7) As each successive element in Group 15 of the Periodic Table is considered in order of increasing atomic number, the atomic radius
A) remains the same B) decreases C) increases

8) Which list of elements is arranged in order of increasing atomic radii?
A) Sr, Ca, Mg, Be B) Li, Be, B, C C) F, Cl, Br, I D) Sc, Ti, V, Cr

9) Which set of symbols represents atoms with valence electrons in the same electron shell?
A) O, S, Te B) Mn, Hg, Cu C) Ba, Br, Bi D) Sr, Sn, I

10)

Atomic Number	Element	First Ionization Energy (kJ/mol)
2	He	
10	Ne	
18	Ar	
36	Kr	
54	Xe	



(a) Complete the data table above for the following Group 18 elements: He, Ne, Ar, Kr, Xe

(b) Using information from the data table, construct a line graph on the grid above following the directions below.
(1) Mark an appropriate scale on the axis labeled "First Ionization Energy (kJ/mol)".
(2) Plot the data from the data table above. Circle each point and connect the points.

EXAMPLE:

(d) Using the graph above, describe the trend in first ionization energy of Group 18 elements as the atomic number increases.

11) Which of the following Group 2 elements has the *lowest* first ionization energy?
A) Mg B) Ca C) Ba D) Be

12) Which of the following ions has the *smallest* radius?
A) Rb^+ B) K^+ C) F^- D) Cl^-

13) The elements in the Periodic Table are arranged in order of increasing
A) atomic radius B) neutron number C) atomic number D) mass number

14) The high electrical conductivity of metals is primarily due to
A) high electronegativities
B) filled energy levels
C) high ionization energies
D) mobile electrons

15) When an atom of phosphorus becomes a phosphide ion (P^{3-}), the radius
A) remains the same B) increases C) decreases

16) As the elements in Period 2 of the Periodic Table are considered in succession from left to right, there is a decrease in atomic radius with increasing atomic number. This may *best* be explained by the fact that the
A) number of protons increases, and the number of shells of electrons increases
B) number of protons decreases, and the number of shells of electrons increases
C) number of protons increases, and the number of shells of electrons remains the same
D) number of protons decreases, and the number of shells of electrons remains the same

17) One electron is removed from both an Na atom and a K atom, producing two ions. Using principles of atomic structure, explain why the Na ion is much smaller than the K ion. [*Discuss both ions in your answer.*]

18) In which group of the Periodic Table do most of the elements exhibit *both* positive and negative oxidation states?

A) 12 B) 17 C) 7 D) 2

19) As a neutral sulfur atom gains two electrons, what happens to the radius of the atom?

20) The amount of energy required to remove the outermost electron from a gaseous atom in the ground state is known as

A) electronegativity
B) activation energy
C) first ionization energy
D) conductivity

21) Compared to the radius of a chlorine atom, the radius of a chloride ion is

A) larger because chlorine loses an electron
B) larger because chlorine gains an electron
C) smaller because chlorine gains an electron
D) smaller because chlorine loses an electron

22) The data table below shows elements *Xx*, *Yy*, and *Zz* from the same group on the Periodic Table.

Element	Atomic Mass (atomic mass unit)	Atomic Radius (pm)
Xx	69.7	141
Yy	114.8	?
Zz	204.4	171

What is the most likely atomic radius of element *Yy*?

A) 185 pm B) 166 pm C) 127 pm D) 103 pm

23) The element in Period 4 and Group 1 of the Periodic Table would be classified as a

A) noble gas B) metalloid C) nonmetal D) metal

24) Which of these elements is the *best* conductor of electricity?

A) N B) Ni C) S D) Br

25) Which element is a brittle, nonconducting solid at 25° C?

A) Al B) Bi C) Br D) S

26) Which of the following Group 15 elements has the *greatest* metallic character?

A) bismuth B) nitrogen C) phosphorus D) antimony

Word Bank: The terms listed below may be of assistance when answering the following questions.

Halogens	Actinide Series
Transition metals	Lanthanide Series
Alkaline Earth Metals	Alkali Metals
Noble Gases	

27) The element lithium is a member of which family?

28) The element strontium is a member of which family?

29) The most UNREACTIVE elements on the table belong to which family?

    a. Why are they unreactive?

30) Chlorine and fluorine are members of which family?

31) Which family is the most reactive metal family on the table?

32) Hydrogen is NOT a metal, yet it is found in group I. Why?

33) There are (7) elements on the table that are found in a pair. They are called the diatomic seven. Iodine (I_2) is an example. Name the other six using their elemental symbols.

    a. _____

    b. _____

    c. _____

    d. _____

    e. _____

    f. _____

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f. _____