Name: _____ Class: _____ Date: _____ ID: A

Honors Chemistry Review Atomic Structure

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. (#2-3)$X(g) + \text{energy} \Rightarrow X^+_{(g)} + e^-$

a. Ionization energy
b. Lattice energy
c. Hydration energy
d. Bond energy
e. Electron affinity

____ 2. (#2-2) Above is a model of a Lewis Dot structure of an atom All of the following can be inferred from the dot diagram above EXCEPT:

a. X is a group 16 element
b. X has two half filled p-orbitals
c. X has at least 10 kernal (internal) electrons
d. X can accept two electrons to become an ion with charge of 2-
e. X has at least four electrons with in the "p" orbital

____ 3. (#2-2) Which of the following sets of quantum numbers (n, l, l_m, l_s) best describes the valence electron of highest energy in a ground-state gallium atom (atomic number 31)?

n = energy level
l = type of orbital (s= 0, p = 1, d = 2, f = 3)
l_m = s = 0 p = +1,0,-1 d = -1,-2,-3,0,+1,+2,+3
l_s = +1/2 or -1/2

a. 4,0,0, 1/2
b. 4,0, 1,1/2
c. 4,1,1,1/2
d. 4,1,2,1/2
e. 4,2,0,1/2

____ 4. (#2-3)Which of the elements above has the smallest ionic radius for its most commonly found ion?

a. O [Ne]
b. La to big
c. Rb to big
d. Mg [Ne]
e. N [Ne]

____ 5. (#2-2)An impossible electronic configuration

a. $1s^2\ 2s^2 2p^5\ 3s^2 3p^5$
b. $1s^2 2s^2 2p^6\ 3s^2 3p^6$
c. $1s^2\ 2s^2 2p^6 2d^{10}\ 3s^2 3p^6$
d. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^5$
e. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^3\ 4s^2$

____ 6. (#2-2)The ground-state configuration for the atoms of a transition element

a. $1s^2\ 2s^2 2p^5\ 3s^2 3p^5$
b. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6$
c. $1s^2\ 2s^2 2p^6 2d^{10}\ 3s^2 3p^6$
d. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^5$
e. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^3\ 4s^2$

Name: _____ ID: A

___ 7. (#2-2)The ground-state configuration for the atoms that have 2 valence electrons.

a. $1s^2\ 2s^2 2p^5\ 3s^2 3p^5$
b. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6$
c. $1s^2\ 2s^2 2p^6 2d^{10}\ 3s^2 3p^6$
d. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^5$
e. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^{10}\ 4s^2$

all ions to- go to config of a noble gas pls

___ 8. (#2-2)The ground-state configuration of a negative ion of a halogen

a. $1s^2\ 2s^2 2p^5\ 3s^2 3p^5$
b. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6$
c. $1s^2\ 2s^2 2p^6 2d^{10}\ 3s^2 3p^6$
d. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^5$
e. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^3\ 4s^2$

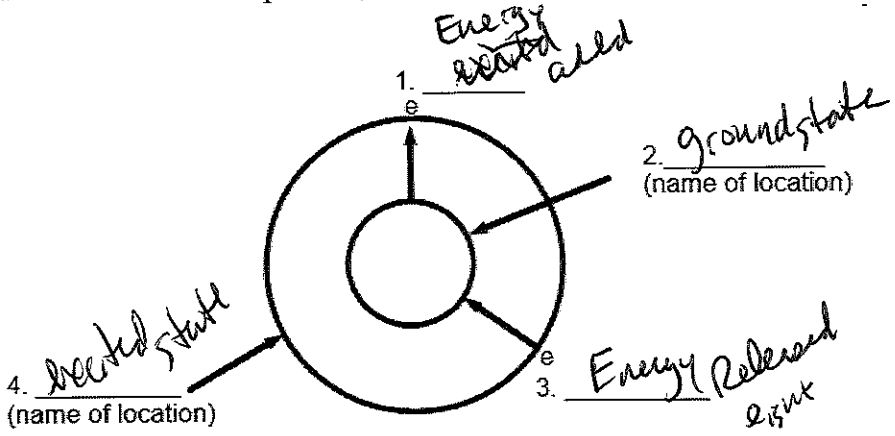
___ 9. (#2-2)The ground-state configuration of a common ion of an alkaline earth element

a. $1s^2\ 2s^2 2p^5\ 3s^2 3p^5$
b. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6$
c. $1s^2\ 2s^2 2p^6 2d^{10}\ 3s^2 3p^6$
d. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^5$
e. $1s^2\ 2s^2 2p^6\ 3s^2 3p^6 3d^3\ 4s^2$

same

___ 10. (#2-3) O^{-2} , F^{-1}, and Ne all have the same number of electrons, Which is bigger and why?

a. O^{-2}, due to less number of protons, less coulombic attraction.
b. F^{-1}, due to more neutrons, these take up more space due to Hund's rule.
c. Ne, due to the fact it is farthest to the right on the periodic table
d. Ne, due to less number of protons, less coulombic attraction



___ 11. (#2-4)
Match the number that correctly describe what is happening at each location.

	1.	2.	3.	4.
a.	Lower level	energy added	light produced	ground state
b.	energy added	light produced	excited state	ground state
c.	excited state	ground state	energy added	ground state
d.	energy added	ground state	light produced	excited state

___ 12. (#2-2) How many ~~total orbitals are there with a principal quantum, n = 4~~

a. 1
b. 4
c. 9
d. 16

$4s^2\ 4p^6$ b/d 4f

Name: _____ **ID: A**

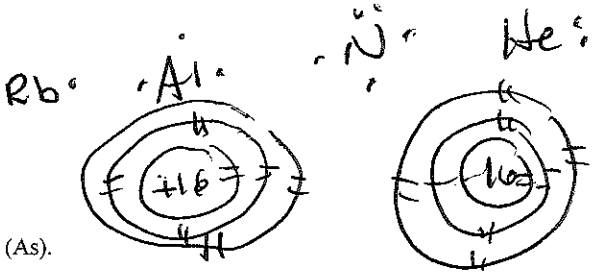
Matching

a. isotope
b. anion
c. cation
d. chemical
e. physical
f. mass number
g. average atomic mass
h. alkaline earth
i. alkali metals
j. principal
k. proton
l. noble gases
m. spin
n. magnetic
o. Hunds

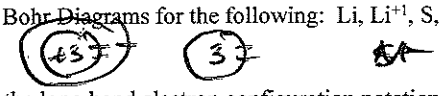
____ 13. (#2-1) An ___A___ is two atoms which have the same number of protons and different number of neutrons.
____ 14. (#2-3) The first family on the periodic table is called the ___i alkali___
____ 15. (#2-2) The ___j___ quantum number represents the energy levels of an atom. principle
____ 16. (#2-2) Two electrons in the same suborbital have different ___m spin___
____ 17. (#2-1) A ___proton k___ is a subatomic particle with a positive charge.
____ 18. (#2-3) The ___l noble gas___ are a family of elements that are very unreactive.
____ 19. (#2-1) The ___f___ is the sum of the protons and the neutrons. Mass #
____ 20. (#2-1) An atom who has gained an electron in order to fill its outer orbital is an ___anion b___
____ 21. (#1) Gas evolution (new substance) is an indicator of a(an) ___d___ change.
____ 22. (#2-1) A positively charge particle is called a(an) ___cation c___

Short Answer

23. Modeling atoms (#2-2)
- Show the Lewis Dot Structure for Rb, Al, N, and He.



- Draw Bohr Diagrams for the following: Li, Li^{+1}, S, and S^{-2}.



- Write the long hand electron configuration notation for arsenic (As).

As: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$

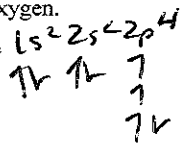
- Write the short hand configuration notation for barium.

Ba: [Xe] $6s^2$

- Write the long hand electron configuration for oxygen.

O: $1s^2 2s^2 2p^4$

- Draw an oribital diagram for oxygen.

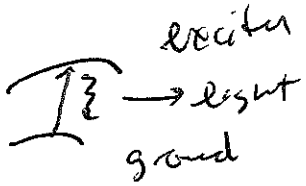


24.

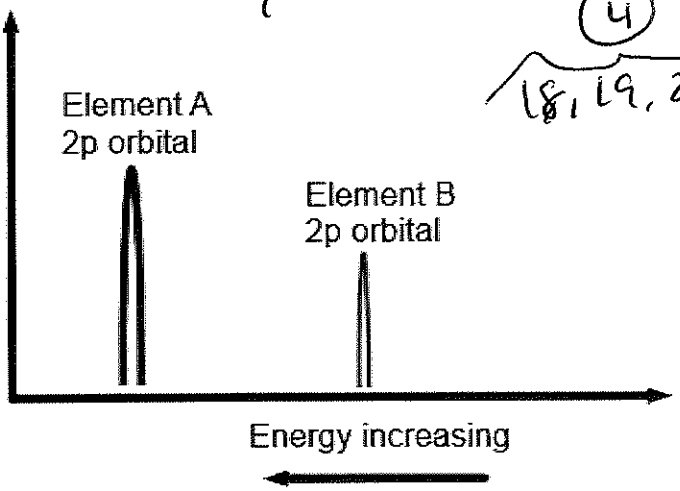
Sy	Atomic #	P^+	^1_0n	Mass #	e^-	Charge
Bi	83	83	120	203	83	none
$^{254}_{99}Es^{2+}$	99	99	155	254	~~99~~ 97	+2

Atomic structure (#2-1)

25. Laboratory structure of the atom #2-4
In lab we burned several different metals. As a result, several different colors were produced. Explain, in great detail, how these colors were produced and indicate a few areas in your everyday life that you see this effect occurring.



26. (#2-1) The most abundant isotopes of hydrogen and oxygen are H-1, H-2, O-16, O-17, respectively. Using these isotopes only, what is the number of different possible values for the molecular mass of water and list them?



27. (#2-3)
Both of the peaks represent electrons removed from the same energy level but from different atoms. Which of the following assumptions are true or false? Give a reason why you chose your answer.
   a. (T/F) Element "A" has more electrons removed from the 2p orbital..
   we don't know this for sure.
   b. (T/F) Element "B" has a larger nucleus then A..
   A has larger nucleus, peak A is more ← due to more p+
   c. (T/F) Electrons from "A" are in the same energy level and orbital but they are closer.
   yes, a little bit. due to more p+