

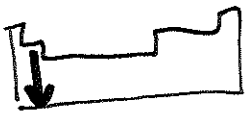
Atomic/electronic structure Multiple Choice Practice Standard #2

AS-13
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1. (#2-2) Consider the following quantum numbers for two different electrons in a ground state atom of phosphorus. Which is a correct comparison of these electrons?
 $3,1,1,-1/2$ $3,1,0,-1/2$
- a. These electrons have the same energy and occupy different orbitals
 - b. These electrons have the same energy and occupy the same orbital
 - c. These electrons have different energies and occupy different orbitals
 - d. These electrons have different energies and occupy different energy sublevels
 - e. These electrons have different energies and occupy the same energy sublevels
2. (#2-3) Which is the correct statement of a trend within a group(family) of elements on the periodic table as atomic number increases?
- I. The number of valence electrons increases

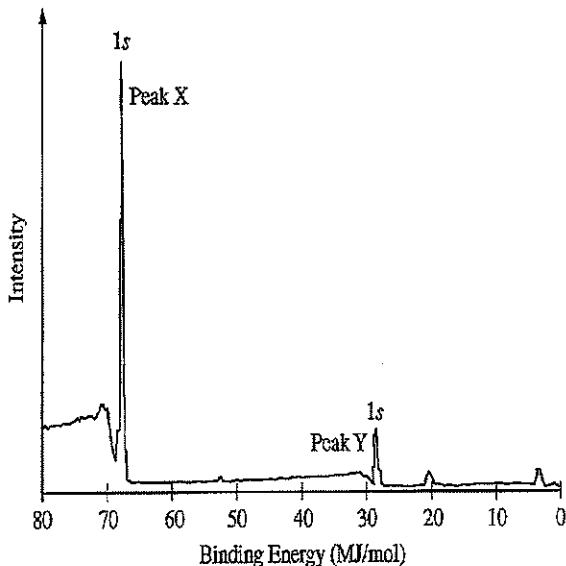
II. The radius of the most common ion increases

~~III. The ionization energy increases~~


- a. I only
 - b. II only
 - ~~c. III only~~
 - d. I and II
 - e. I, II, and III
3. (#2-2) An atom with the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$ has an occupied but incomplete
- a. 2s sublevel
 - b. 3s sublevel
 - c. 4s sublevel
 - d. 2nd principal energy level
 - e. 3rd principal energy level
4. (#2-3) Which is a correct comparison of the Cl^0 atom to the Cl^- ion?
- I. The radius of the Cl^0 atom is greater than the radius of the Cl^- ion?
 - II. The mass of the Cl^0 atom is about 1 amu greater than the mass of the Cl^- ion
- No, e⁻ repulsion*
No.
- a. I only
 - b. II only
 - c. Both I and II
 - d. Neither I or II
5. (#2-2) What are the number of occupied suborbitals in the third principal energy level of a nickel atom in the ground state?
- d. 8*
e. 9

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$

(1) (3) (5)



10. (#2-2d) How many electrons are in each of the substances S orbital

	X	Y
a.	1	1
b.	1	2
c.	2	1
d.	2	2

*Size = #
X is larger
So binds
only holds 2e-*

11. (#2-3) X has a higher ionization energy than Y due to

- a. Larger radius
- b. Larger electronegativity
- c. Larger amount of shielding
- d. Larger number of protons

12. (#2-2d) Which of the following substances could be an example of substance Y?

- a. Mg
- b. Al
- c. He
- d. K

13. (2-1) Carbon-13 is a radio active isotope used to determine the age of old living fossils. Which of the following is true relative to isotope Carbon 13.

- I. The majority of carbon atoms on contain 6 protons and 7 neutrons *no*
 - II. Carbon-12 is more abundant on earth than carbon-13 *yes*
- a. I only
 - b. II only
 - c. Both I and II
 - d. Neither I or II

14. (#2-1) The aluminum atom can oxidize to form an ion. Which of the following is true regarding this process.

- I. The oxidation is $Al \Rightarrow Al^{3+} + 3e^-$ *yes*
- II. Al is an isotope of Al^{3+} *no*

- a. I only
- b. II only
- c. both I and II
- d. Niether I or II

