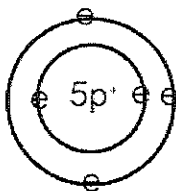


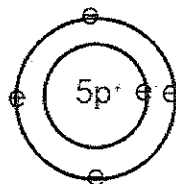
PQ1 Atomic structure quiz

Multiple Choice

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



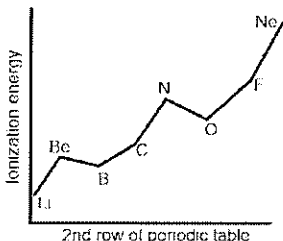
1. (#2-1b) The atom above is most likely a (metal/non-metal) and will form a ____ ion?
- a. metal/+1
b. non-metal/-1
c. metal/+3
d. non-metal/-3



$1s^1 2s^2 2p^2 \leftarrow$ excited state

2. Which of the following statements is true
- I. The electron configuration for this atom is $1s^2 2s^2 2p^1$ No
II. The model is violating Hund's Rule. — Don't know — so No
III. The model is indicating an atom in an excited state. Yes
- (#2-2)
- a. I only
b. II only
c. III only
d. II and III only

3. (#2-3)



↑ atomic attraction

Which of the following is the best reason that ionization energy generally increases from left to right across the second row of the periodic table?

- a. As the atomic number increases, the electrons are harder to remove. ← second Best
b. ionization energy increases as the atomic number increases in a period.
c. As the atomic number increases, more electrons are added to the atoms, thus increasing the electron-electron repulsions.
d. more protons in the nucleus causes an increase in effective nuclear charge, making it harder to remove the electrons. ← Best

4. (#2-4) A particle is deflected through a magnetic field to determine the mass/charge ratio.
- a. Flame test
b. Photo electron spectroscopy
c. Infrared spectroscopy (IR)
d. Mass spectroscopy (mass spec)

Short Answer

1. For each of the following statements add a (< > or <<< >>>) indicate a reason why one atom is bigger/smaller. If possible explain in terms of coulombic attraction (Nuclear charge and or energy levels).

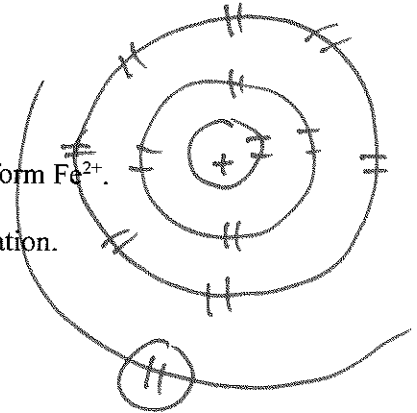
a) Cl > Ar argon is smaller due to more protons pulling with a greater Coulombic force. (effective nuclear charge)

b) Cl⁻¹ > Cl Cl⁻ is larger due to more e⁻ repulsion

c) Al <<< Ga Ga is larger due to more e⁻ levels

2. Answer the following questions relative to the Iron atom.

a) To the right draw a Bohr diagram of the Fe atom and circle the electrons lost to form Fe²⁺.



b) 1s²2s²2p⁶3s²3p⁶3d⁴4s² Is this correct, if not rewrite the correct electron configuration.

No, 1s²2s²2p⁶3s²3p⁶3d⁶

Phosphide gained 3 electrons in order to become an ion.

b) What element is Phosphide iso-electric with? Ar

c) Write the equation for the reduction of P atom to the phosphide ion. P + 3e⁻ → P⁻³

d) Is Phosphide ion bigger or smaller than phosphorus atom? Why? e⁻ repulsion

3. MgCl₂ tablet contains 1 Mg²⁺ for every 2 Cl⁻. For each of the following indicate if the statement is true or false. If wrong... Fix it to the best of your ability or make a statement that is correct.

a. The proportions are correct.

1:2 ratio | No should be twice as many Cl⁻

b. Sizes are correct.

yes, Cl⁻ has 1 more e⁻ level

4. Two make the following statements relative to the bond indicated, justify or nullify each statement.

Student A: The bond indicated in the diagram is coulombic attraction.

True

Student B: The bond indicated is not coulombic it is ionic.

Nullify

Coulombic = Ionic

