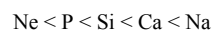


Unit 3 Trashketball!

Oct 16-7:34 AM

3 points

Put the following elements in order of increasing atomic radius: Mg, Na, P, Si and Ne

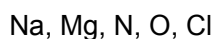


Atomic radius decreases left to right across the periodic table, and increases from the top of the table to the bottom of the table.

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3 points

Put the following in order of increasing first ionization energy: O, N, Na, Mg, Cl



Ionization energy increases left to right across the periodic table, and decreases top to bottom on the periodic table.

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3 points

Which of the following would you expect to have the HIGHEST second ionization energy?

- (i) $1s^2 2s^2 2p^6 3s^1$
- (ii) $1s^2 2s^2 2p^6 3s^2$
- (iii) $1s^2 2s^2 2p^6 3s^2 3p^1$
- (iv) $1s^2 2s^2 2p^6 3s^2 3p^4$
- (v) $1s^2 2s^2 2p^6 3s^2 3p^5$

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5 points

5) Which electron configuration represents a violation of Hund's rule for an atom in its ground state?

- A)

1s	2s	2p
↑	↑↓	□ □ □
- B)

1s	2s	2p
↑↑	↑↓	□ □ □
- C)

1s	2s	2p
↑↓	↑↓	↑ ↓ □
- D)

1s	2s	2p
↑↓	↑↓	↑ □ ↑
- E)

1s	2s	2p
↑↓	↑↓	↑ ↑ ↑

ANSWER: C

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5 points

In which orbital does an electron in a lead atom experience the greatest effective nuclear charge?
(1s, 2s, 2p, 3s, 3p, etc...)

1s. The electrons closest to the nucleus experience the greatest effective nuclear charge. (Coulomb's Law)

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5 points

Why does atomic radius increase as you move down a column of the periodic table?

As you move down a column, electrons are added into additional energy levels, which are **farther from the nucleus** and experience greater shielding from the nuclear charge.

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5 points

Which one of the following compounds would produce an acidic solution when dissolved in water?

- A) Na_2O
- B) CaO
- C) MgO
- D) CO_2
- E) SrO

CO_2 , because it is a nonmetal oxide. FUN FACT: That is why carbonated drinks are acidic, because the "carbonation" comes from CO_2 !

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10 points

Why are alkali metals more reactive than alkaline earth metals?

Alkali metals have lower ionization energies.

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10 points

Element M reacts with oxygen to form an oxide with the formula MO . When MO is dissolved in water, the resulting solution is basic. Element M could be...

- A) Na
- B) Ba
- C) S
- D) N
- E) C

ANSWER: Ba, because it is a metal with a +2 charge

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10 points

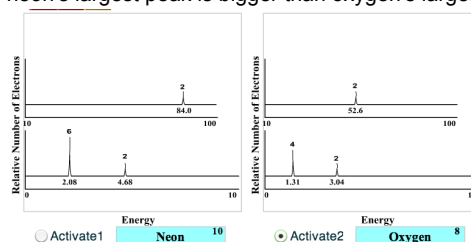
Which would you expect to be more dense: an iodine atom, or a bromine atom? Explain your answer.

Iodine would be more dense. Iodine has more electrons than bromine, but since iodine also has more protons, it has a greater effective nuclear charge. This means an iodine nucleus exerts more force on its electrons than a bromine nucleus, and the electrons are pulled closer to the middle of the atom.

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10 points

PES spectra for neon and oxygen are shown below. Explain why the neon's largest peak is bigger than oxygen's largest peak.



The largest peak in the PES spectrum corresponds to the 1s electrons in each atom. Since neon is larger and has more protons than oxygen, it has a greater effective nuclear charge, which means it takes more energy to remove the 1s electrons.

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