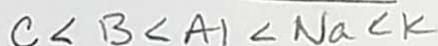


Answer Key

1. Arrange the following elements in order of increasing size: Al, B, C, K, and Na.

C - 77, B - 97, Al - 143
Na - 186 K - 231

2. Arrange the following elements in order of increasing size: Ca, Rb, P, Ge, and Sr.



P - 110, Ge - 123, Ca - 197, Sr - 215, Rb - 243

3. Circle the atom or ion in each pair that has the larger radius.

a. Cl or Cl^-

b. Al or O

c. In or I

 $\rightarrow$ Book $\Rightarrow Z_n = 1.44 \text{ \AA}$, $I = 1.33 \text{ \AA}$
PT $\Rightarrow 151 \text{ pm (In)}$, 215 pm (I)

4. Select the atom or ion in each pair that has the larger radius.

a. Cs or Rb

b. O^{2-} or O

c. Br or As

Book PT $\Rightarrow$ $Br - 1.14 \text{ \AA}$, $As - 1.19 \text{ \AA}$
PT $\Rightarrow 195 \text{ pm}$, 116 pm
 $\rightarrow$ Calculated as a van der Waals radius

5. Which of the following groups of elements is arranged correctly in order of increasing ionization energy?

(Answer by circling the correct answer)

a. $C < Si < Li < Ne$ b. $Ne < Si < C < Li$ c. $Li < Si < C < Ne$ d. $Ne < C < Si < Li$

Li - 520 kJ/mol

Si - 786 kJ/mol

C - 1086 kJ/mol

Ne - 2081 kJ/mol

6. Arrange the following atoms in order of increasing ionization energy: Li, K, C, and N.



Li - 520 kJ/mol

K - 419 kJ/mol

C - 1086 kJ/mol

N - 1402 kJ/mol

7. Arrange the following atoms in order of increasing ionization energy: Si, K, As, and Ca.



Si - 786 kJ/mol

K - 419 kJ/mol

As - 947 kJ/mol

Ca - 590 kJ/mol

8. Compare the elements Na, Mg, O, and P.

a. Which has the largest atomic radius? Nab. Which has the highest electron affinity? O

c. Place the elements in order of increasing ionization energy.

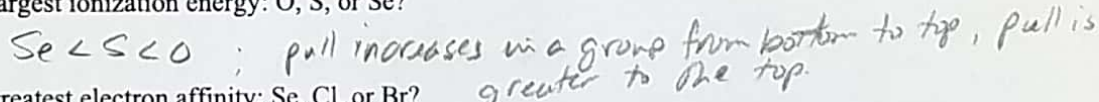


9. Explain each answer briefly.

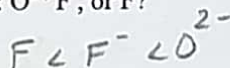
a. Place the following elements in order of increasing ionization energy: F, O, and S.



b. Which has the largest ionization energy: O, S, or Se?



c. Which has the greatest electron affinity: Se, Cl, or Br?

d. Which has the largest radius: O^{2-} , F^- , or F?

e. Rank the following in order of increasing atomic radius: O, S, and F.



f. Which has the largest ionization energy: P, Si, S, or Se?



P has a half-filled p-subshell, more stabilized which means higher energy

g. Place the following in order of increasing radius: Ne, O^{2-} , N^{3-} , or F^- .