

Chem E-1a
Friday Review Problems
Chapter 8: The Periodic Table

1. Provide the most stable electron configuration for each of the following ions. You may use the noble-gas abbreviations. How many unpaired electrons does each of these ions have in the ground state?

a) Se^{2-}

b) Pt^{2+}

c) Pb^{4+}

d) V^{3+}

2. Explain the following observations.

- a) The first ionization energy of Al is less than the first ionization energy of Mg, but the second ionization energy of Al is greater than the second ionization energy of Mg, and, finally, the third ionization energy of Al is less than the third ionization energy of Mg.

2. (cont.)

b) The electron affinity of N is very close to zero, but the electron affinity of its neighbor C is a large negative value (-122 kJ/mol).

c) The first electron affinity of oxygen is negative, but the second electron affinity of oxygen is positive.

3. Compare the radius of the following pair of atoms or ions. Explain your answer.

a) Rb and Sr

b) Rb and Rb^+

c) Rb^+ and Kr

4. Choose the element or ion with the smallest radius and explain your answer.

a) Ga B O F Br

b) O^{2-} F^{1-} Ne Na^+ Mg^{2+}

5. Choose the element with the higher first ionization energy and explain your choice.

a) Na Mg

b) P S