

Ch 12: 62(abc) Calculate the energy (in kJ/mole) required to remove the electron in the ground state for each of the following one-electron species, using the Bohr mode.

- a) H b) He⁺ c) Li²⁺

66(a-d,g) What is the maximum number of electrons in an atom that can have these quantum numbers?

- a) n=4
 b) n=5, ml=1
 c) n=5, ms= 1/2
 d) n=3, l=2
 g) n=2, l=1, ml=-1, ms=-1/2

78. Which of the following electron configurations correspond to an excited state?

Identify the atoms and write the ground state electron configuration where appropriate:

- a) 1s²2s²3p¹
 b) 1s²2s²2p⁶
 c) 1s²2s²2p⁴3s¹
 d) [Ar]4s²3d⁵4p¹

Chapter 13: 3 Using only the periodic table, predict the most stable ion for Na, Mg, Al, S, Cl, K, Ca, Ga. Arrange these from largest to smallest radius and explain why the radius varies as it does. Compare your predictions with Fig 13.7

Chapter 13: 12 Use Coulomb's Law:

$$V = \frac{Q_1 Q_2}{4\pi\epsilon_0 r} = 2.31 \cdot 10^{-19} J - nm \left(\frac{Q_1 Q_2}{r} \right)$$

to calculate the energy of interaction for the following two arrangements of charges, each having the magnitude equal to the electron charge:

a) $(+1) \xleftrightarrow{1 \cdot 10^{-10} m} (-1) \xleftrightarrow{\infty} (+1) \xleftrightarrow{1 \cdot 10^{-10} m} (-1)$

b)

$$\begin{array}{ccccc} 1 \cdot 10^{-10} m & & (-1) & & 1 \cdot 10^{-10} m \\ & \nearrow & & \nwarrow & \\ & (+1) & & (+1) & \\ & \nwarrow & & \nearrow & \\ 1 \cdot 10^{-10} m & & (-1) & & 1 \cdot 10^{-10} m \end{array}$$