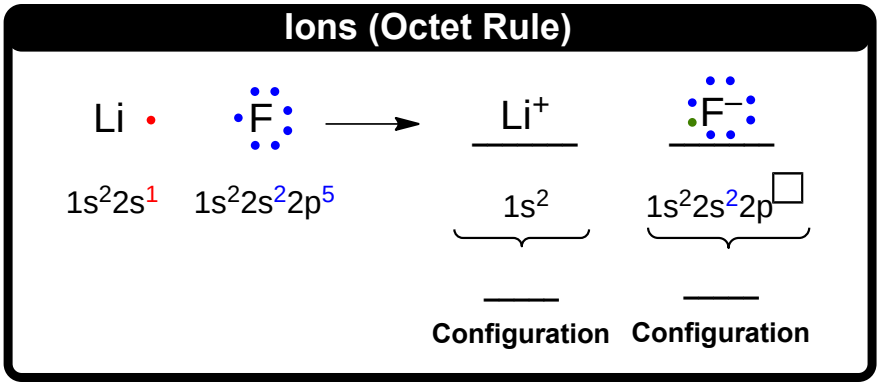
CONCEPT: IONS AND THE OCTET RULE

● Tendency of Main Group Elements in achieving _____ valence electrons or a _____ outer shell by undergoing chemical reactions.

□ Main Group Metals **lose** electrons to be like the Noble Gas that is _____ them in the Periodic Table.

□ Non-Metals **gain** electrons to be like the Noble Gas that is _____ them in the Periodic Table.

- Creates totally filled ____ and ____ subshells that lead to _____ stability and _____ further chemical reactivity.



EXAMPLE: How many electrons must the magnesium atom (Z =12) lose in order to obtain a filled outer shell?

a) 1 b) 3 c) 2 d) 5

Electron Configurations (Cations)

● With a metal cation, we first remove electrons from the _____ shell number (*n* value).

□ The *n* value provides the shell number or energy level of the electron.

$1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$

n = n = n =

EXAMPLE: Write the condensed electron configuration for the Na^+ ion.

STEP 1: Provide the electron configuration for the neutral form of the element.

STEP 2: Begin removing electron(s) from the ____ numbered shell to obtain the desired charge.

□ Recall, each electron removed causes the ion charge to increase by _____.

CONCEPT: IONS AND THE OCTET RULE

Electron Configurations (Anions)

- With a non-metal anion, add an electron(s) to the orbitals with available space.

EXAMPLE: Write the full electron configuration for the N^{3-} ion.

STEP 1: Provide the electron configuration for the neutral form of the element.

STEP 2: Add electron(s) to the orbitals that can accommodate more electrons.

PRACTICE: Determine the electron configuration for the Cl^- ion.