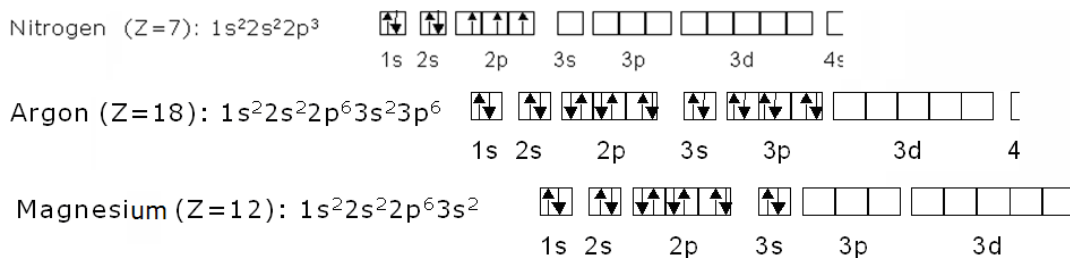


Electron Configurations: Solutions

1. Determine the electron configurations of these atoms using

- a) shorthand notation
- b) orbital diagrams
 - nitrogen
 - argon
 - magnesium

Suppose that those atoms are in their ground-state.



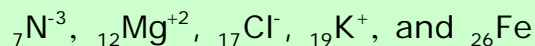
2. Determine if the following electron configurations represent

- a. the ground-state electron configuration
- b. the electron configuration of an excited state
- c. an impossible electron configuration

- a) Li: $1s^2 2s^1$ d) He: $1p^1$
 b) C^+ : $1s^2 2s^1 2p^1 2d^1$ e) O^+ : $1s^2 2s^2 2p^3$
 c) H^- : $1s^2$

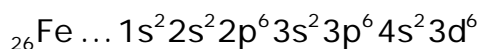
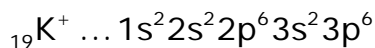
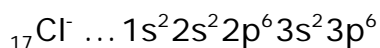
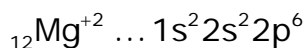
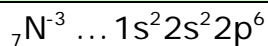
- a) Ground-state electron configuration
- b) Impossible
- c) Ground-state electron configuration
- d) Impossible
- e) Ground-state electron configuration

3. Write the electron configurations of the following atoms and ions



Determine which ones are isoelectronic (the same amount of electrons and, therefore, those who have the same electron configuration).

Determine which are the unpaired electrons.



The first two species (nitrogen anion & magnesium cation) are isoelectronic with each other (10 electrons).

The next two species (chlorine anion and potassium cation) are isoelectronic with each other (18 electrons)

The iron atom is the only one that has unpaired electrons (3 unpaired electrons)

4. Write which electron configurations are not possible:



- a) Possible; ground-state electron configuration
- b) Impossible
- c) Possible; excited state electron configuration
- d) Impossible

5. Determine if the following electron configurations correspond to ground-states or to excited states.

- a) $1s^2 2s^2 2p^6 3s^1$ c) $1s^2 2s^2 2p^3$
b) $1s^2 2s^1$ d) $1s^2 2s^2 2p^4 3s^1$

- a. Ground-state
b. Ground-state
c. Ground-state
d. Excited state

6. Order the following orbits in increasing energy order: 3p, 3d, 4s, 4p, 4d, 4f and 5s.

$3p < 4s < 3d < 4p < 5s < 4d < 4f$