Chemistry: Form Ls2.3A Name _____

ATOMS Date _____ Period _____

Drawing Atomic Diagrams

Aim

- use the periodic table to draw atomic diagrams

Notes

Atomic Diagrams (using the Periodic Table)

- ★ Atomic number (Z) = number of protons
- ★ Atomic mass number (A) = number of protons and number of neutrons
- ★ Number of neutrons = Atomic mass number – Atomic number
- ★ Number of Electrons = number of protons
  - ☆ Higher energy levels have room for more electrons
    - ★ maximum number of electrons per energy level

Energy Level	Maximum Number of Electrons
1	2
2	8
3	18
4	32
5	(50)
6	(72)
7	(98)

  - ★ an outer shell usually does not have more than 8 electrons

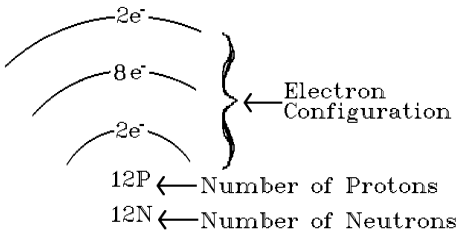
Bohr Diagrams

- ★ Example - the atomic number of magnesium is 12 and the mass is approximately 24. This means the number of neutrons is 12. The electron configuration is 2-8-2. This information can be used to draw a diagram of magnesium. See next column.

Example: Magnesium

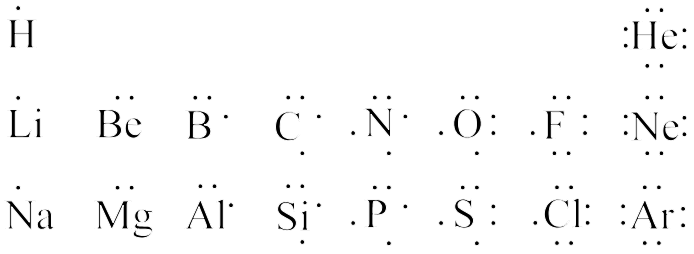
Atomic Mass 24
-Atomic Number 12
Neutrons 12

Electrons 12
(2-8-2)



Electron-dot Symbols

- ★ show valence electrons as dots at 12 o'clock, 3 o'clock, 6 o'clock, and 9 o'clock and the kernel as a symbol
  - ☆ valence electrons
    - ★ electrons in the outermost principal energy level
    - ★ responsible for properties of elements
  - ☆ kernel - the rest of the atom (nucleus and other electrons)
- ★ examples

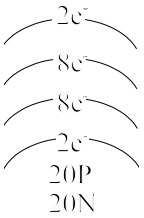


Answer the multiple choice questions below by circling the number of the correct response

1. What is the electron configuration of a sulfur atom in the ground state? (1) 2–4 (2) 2–6 (3) 2–8–4 (4) 2–8–6

2. A neutral atom always has an equal number of (1) neutrons and electrons, (2) neutrons and protons, (3) protons and electrons, (4) protons, electrons, and neutrons.

3. Below is a Bohr-Rutherford diagram of an element.



Which element could be represented by this diagram? (1) calcium (2) cadmium (3) chlorine (4) no known element

4. In the box provided, draw the electron–dot (Lewis) structure of an atom of calcium.

5. In the box provided, draw the electron–dot (Lewis) structure of an atom of chlorine.

6. Which is the electron dot structure for the atom whose electronic structure is 2–8–7 ? (1) $\dot{X}\cdot$ (2) $\cdot\dot{X}\cdot$ (3) $\cdot\ddot{X}\cdot$ (4) $\cdot\ddot{X}:$

7. What is the total number of electrons in the second principal energy level of a calcium atom in the ground state? (1) 6 (2) 2 (3) 8 (4) 18

8. If $\cdot\ddot{X}\cdot$ represents the electron-dot symbol of an element , that element could be (1) C (2) O (3) B (4) N