

Name: _____

Date: _____

Lesson 4 Atoms and Ions (Nelson p.174-177)

How do Atoms and Ions Differ?

1) ATOM

- Has _____ charge
- Number of protons is _____ to number of electrons
- _____ or _____ electron(s) to have a _____ outermost orbit (become stable) by forming an _____ (a charged atom)
- Electrons move from a metal to a non-metal to form _____ → _____ occur
- Only electron(s) in the _____ can move.

2) ION

- A _____ atom (positive or negative)
- Number of protons is _____ from the number of electrons (number of protons \neq number of electrons)



Elements become stable in 1 of 3 ways:

- | | | |
|--|---|------------------------------|
| <ol style="list-style-type: none"> 1. Metals <u>lose</u> electrons → <u>positive</u> ions 2. Non-metals <u>gain</u> electrons → <u>negative</u> ions | } | Ionic Compounds |
| <ol style="list-style-type: none"> 3. Non-metals <u>share</u> electrons | | → Molecular Compounds |

Bohr- Rutherford Diagrams for IONS

Example 1: Beryllium

Beryllium (Be) is an element on the periodic table.

It has an **atomic number** of _____.

How many **protons** does Beryllium have? _____ Its **charge** will be **positive** or **negative** (*circle 1*).

How many **electrons** does Beryllium have? _____ Its charge will be **positive** or **negative** (*circle 1*).

Beryllium is a **metal** or **non-metal** (*circle 1*).

Beryllium is in **Group** _____.

Therefore, Beryllium is going to **lose** or **gain** (*circle 1*) _____ (how many?) electrons to be stable.

The atom still has _____ protons. Its **charge** will still be _____.

But, the atom now has _____ electrons. Its **charge** will still be _____.

Therefore, the **overall charge** of the atom will be _____ because there are more _____ than _____. (**Protons – electrons**)

So, it's new **symbol** for the charged atom (ion) will be _____, and Beryllium has become a **positive** or **negative** (*circle 1*) ion.

Draw Beryllium ion

p = _____

n = _____

e = _____

p = _____ (+)

e = _____ (-)

charge = _____

Example 2: Nitrogen

Nitrogen (N) is an element on the periodic table.

It has an **atomic number** of _____.

How many **protons** does Nitrogen have? _____ Its **charge** will be **positive** or **negative** (*circle 1*).

How many **electrons** does Nitrogen have? _____ Its charge will be **positive** or **negative** (*circle 1*).

Nitrogen is a **metal** or **non-metal** (*circle 1*).

Nitrogen is in **Group** _____.

Therefore, Nitrogen is going to **lose** or **gain** (*circle 1*) _____ (how many?) electrons to be stable.

The atom still has _____ protons. Its **charge** will still be _____.

But, the atom now has _____ electrons. Its **charge** will still be _____.

Therefore, the **overall charge** of the atom will be _____ because there are more _____ than _____. (**Protons – electrons**)

So, it's new **symbol** for the charged atom (ion) will be _____, and Nitrogen has become a **positive** or **negative** (*circle 1*) ion.

Draw Nitrogen ion

p = _____

n = _____

e = _____

p = _____ (+)

e = _____ (-)

charge = _____

Example 3: Potassium

Potassium (K) is an element on the periodic table.

It has an **atomic number** of _____.

How many **protons** does Potassium have? _____ Its **charge** will be **positive** or **negative** (*circle 1*).

How many **electrons** does Potassium have? _____ Its charge will be **positive** or **negative** (*circle 1*).

Potassium is a **metal** or **non-metal** (*circle 1*).

Potassium is in **Group** _____.

Therefore, Potassium is going to **lose** or **gain** (*circle 1*) _____ (how many?) electrons to be stable.

The atom still has _____ protons. Its **charge** will still be _____.

But, the atom now has _____ electrons. Its **charge** will still be _____.

Therefore, the **overall charge** of the atom will be _____ because there are more _____ than _____. (**Protons – electrons**)

So, it's new **symbol** for the charged atom (ion) will be _____, and Potassium has become a **positive** or **negative** (*circle 1*) ion.

Draw Potassium ion

p = _____

n = _____

e = _____

p = _____ (+)

e = _____ (-)

charge = _____