Atoms and Ions

Atom is the basic unit of an element that is determined by the number of **positively charged** protons in the nucleus and **negatively charged electrons** orbiting in the levels around. A **stable** atom contains the same number of electrons as protons is called **"neutral"** .However, when electrons are added or removed, the stable atom becomes an **ion**.

Ion is an electrically charged particle or unit produced by either **removing** electrons from a neutral atom to give a **positive ion** or **adding** electrons to a neutral atom to give a **negative ion**. If electrons are removed, the **net** charge of the ion will be positive and known as a **cation**. A cation (+)' is an ion with **fewer electrons** than protons, giving it a **positive charge**.

When electrons are added, the net charge of the ion becomes **negative** and known as an **anion**. An anion (−), is an ion with **more electrons** than protons, giving it a net **negative charge** (since electrons are negatively charged and protons are positively charged).

In other words, Neutral atoms can be turned into positively charged ions by **removing** one or more **electrons**. A neutral **sodium** atom, for example, contains 11 protons and 11 electrons. By removing an electron from this atom we get a positively charged **Na^+ ion** that has a net charge of +1. In addition, atoms that **gain extra** electrons become negatively charged. A neutral **chlorine** atom, for example, contains 17 protons and 17 electrons. By adding one more electron we get a negatively charged **Cl^-** ion with a net charge of -1.

The **gain** or **loss** of electrons by an atom to form negative or positive ions has an enormous impact on the **chemical** and **physical** properties of the atom. Sodium metal, for example, which "wish" consists of **neutral sodium atoms**, **bursts** into **flame** when it comes in contact with **water**. **Neutral chlorine** atoms instantly combine to form Cl_2 molecules, which are so reactive that entire communities are **evacuated** when trains carrying **chlorine gas derail**. Positively charged **Na^+** and negatively charged **Cl^-** ions are so **unreactive** that we can safely take which is the **ionic compound salt.**

When an atom has an equal number of negative electric charges (the electrons) and positive electric charges (the protons). The total electric charge of the atom is therefore zero and the atom is said to be neutral. In contrast, when an atom loses or gains an electron, the atom is then said to be electrically charged, or "ionized". There is a major difference between the neutral state and the ionized state.

1- Pre-reading tasks: Answer the following questions, before reading the text.

- Discuss the title of the text.
- What do you think the text will be about?

2- While reading tasks:

- Silently, read the text progressively, building your understanding, paragraph after paragraph.
- Search for the meaning of the words that are in bold character and give synonyms for the underlined ones in the text while you are reading.
- Write the main idea of each paragraph you have finished reading.
- Discuss these ideas with your teacher.
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Answer the following question:

1. What are the properties of stable atom ?
2. How do stable atoms form ions?
3. What do the symbols in ions (+) and (_) refer to ?

Are the following statements true or false?

1- Losing electrons result in negatively charged ion .

2- Mixing **Na^+** **Cl^-** form salt.

3- Anion is a charged particle with fewer electrons than protons, .

4- the atom becomes ionized by losing or gaining protons.

5- When water comes in contact with Sodium , there is little tendency to react chemically.

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3- Homework:

- Do the same reading tasks at home with the paragraphs that you have not discussed in the classroom.
- Practice the pronunciation of the words that are in bold character in the text.
- Give different examples of neutral atoms and ions.

diphthongs [aɪ]

Say these English words out loud: *fly, tie, ride, smile*. Now make the vowel sound [aɪ] again but hold it at the beginning [aaa]. The first part of the sound is the low

front [a], but then the tongue moves up quickly at the end of the sound, ending it [ɪ]. So the [aɪ] sound is a diphthong, and it gets transcribed with two consecutive symbols:[aɪ].

Bring words from the text which include this diphthong