

## IONS

### Positive and Negative Electric Charges

A **neutral atom** or group of atoms (molecules\*) ...

... **becomes an ion** by **gaining or losing** ...

... **one or more electrons or protons**.

**Electrons** and **protons** have **equal, but opposite, charges** ...

... **an ion's** charge is always expressed as a whole number ...

... **either being positive or negative**.

### Ion Composition:

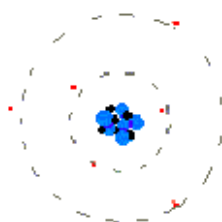
- **Simple** consisting of only **one charged atom**.
- **Complex** consisting of an **aggregate of atoms with a net charge**.

### Cations and Anions:

- If an **atom** or group of atoms **loses electrons or gains protons** it/they **will have a net positive charge and is/are called a cation**.
- If an **atom** or group of atoms **gains electrons or loses protons** it/they **will have a net negative charge and is/are called an anion**.

#### This Atom is Neutral

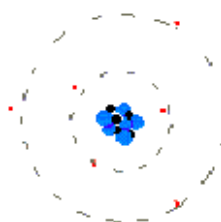
*Same number of protons and electrons*



- 6 Protons
- 6 Neutrons
- 6 Electrons

#### This Atom is Negatively Charged

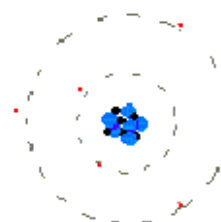
*More electrons than protons*



- 5 Protons
- 6 Neutrons
- 6 Electrons

#### This Atom is Positively Charged

*More protons than electrons*



- 6 Protons
- 6 Neutrons
- 5 Electrons

### Cations and Anions affect Humans

Changes in cation/anion ratios affect the way people feel.

- **-ve charged anions** may **favourably enhance/stimulate people's moods**.
- **+ve charged cations** may **adversely affect people's moods**.

\* a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction.