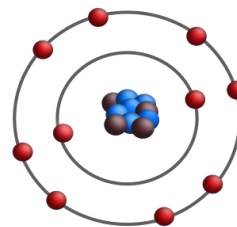


SCIENCE 9: VALENCE SHELLS AND IONS

Valence Shells and Valence Electrons:



- **Valence shell** is the outermost shell containing electrons
- **Valence electrons** are electrons in the valence shell

1. Atoms in the same group have the same number of _____.
2. Atoms in the same period have the same number of _____.

During a chemical reaction, atoms _____ valence electrons with other atoms until they have _____.

_____ are unreactive because their valence shells are already full.

Ion: a charged 'atom' that is formed when a neutral atom _____ electrons

Cation: _____ charged ion (e.g. Ca^{2+} , Na^+), formed when atom *loses* electrons

Anion: _____ charged ion (e.g. O^{2-} , P^{3-}), formed when atom *gains* electrons

Bohr models of ions are very similar to Bohr models of atoms. Two key differences:

- Valence shell is full
 - (Note: the fewer electrons that have to move, the better. E.g. oxygen with 6 valence electrons will gain two electrons to form its 2- ion instead of losing six electrons.)
- Square brackets and ion charge

Examples: Draw the Bohr models of fluorine and magnesium atoms and their ions.

Fluorine	Beryllium
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Practice:

1. Explain why metals tend to lose electrons and non-metals tend to gain them when forming ions.
2. On your periodic table, the ion charge of neon is listed as "0". Why is this the case?
3. On the back of this page, draw the Bohr models of: a) oxygen atom and ion; b) magnesium atom and ion; c) nitrogen atom and ion; d) chlorine atom and ion