Ions & Ionic Bonding

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What is an Ion?

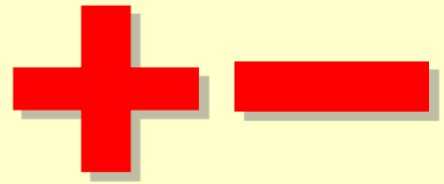
An ion is an atom, or group of atoms with a positive or negative charge.

- To become positively charged the atom loses an electron.

- To become negatively charged the atom gains an electron.

What is an Ion?

An **ion** is an atom or group of atoms that has an electrical charge, either positive and negative.



Atoms with incomplete outer electron shells are unstable. By either gaining or losing electrons, atoms can obtain full outer electron shells and become stable.

Ionic bonding occurs when a metal DONATES an electron to a non-metal.

Group 1 –donates

Group 7- accepts

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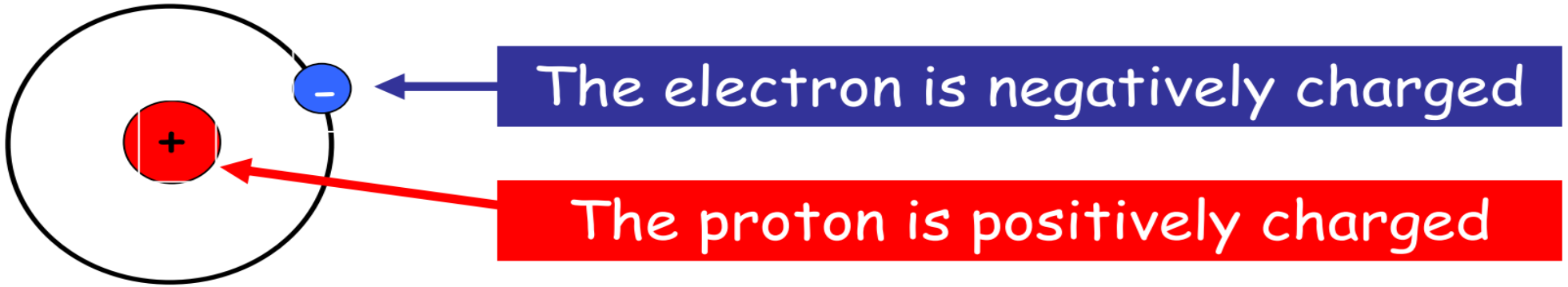
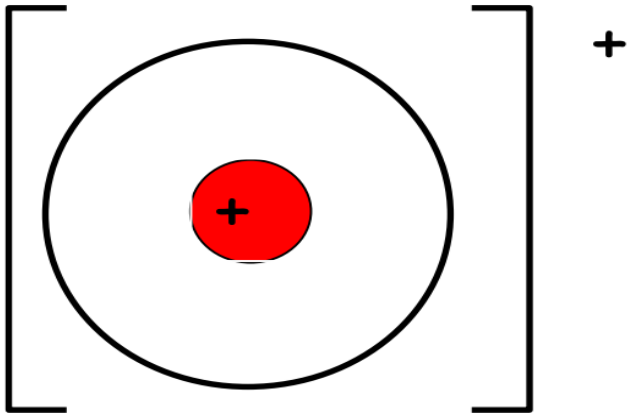
An ion is formed when an atom gains or loses electrons and becomes charged:



If we "take away" the electron we're left with just a positive charge:

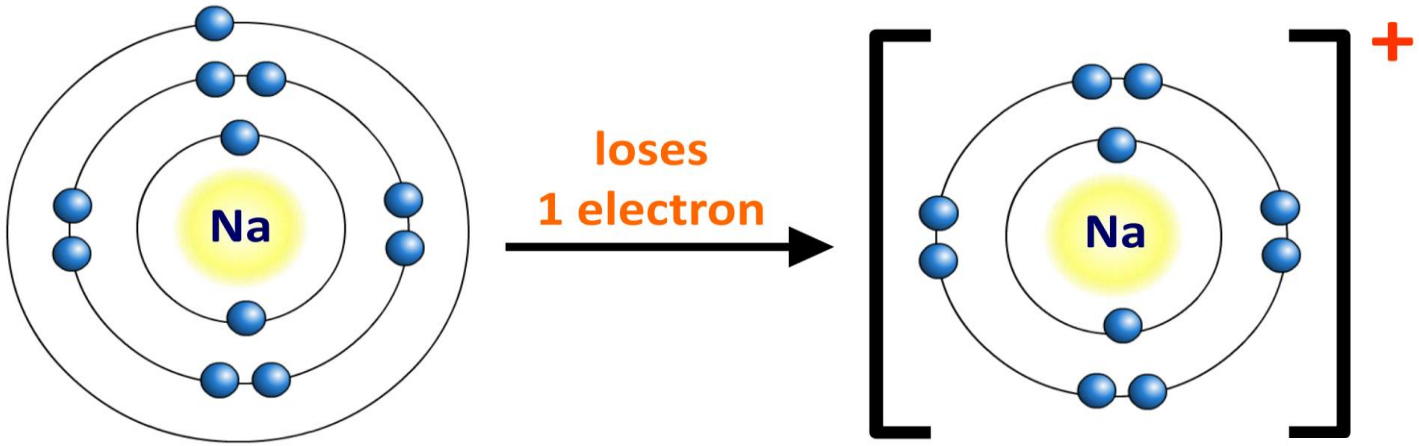


This is called an ion (in this case, a positive hydrogen ion)

How is a sodium ion formed?

Sodium atom:		
11 protons	=	+11
11 electrons	=	-11
Total charge	=	**0**

Sodium ion:		
11 protons	=	+11
10 electrons	=	-10
Total charge	=	**+1**



2.8.1
(partially full outer shell)

[2.8]
(full outer shell)

Remember - Atoms like to have FULL electron shells!!

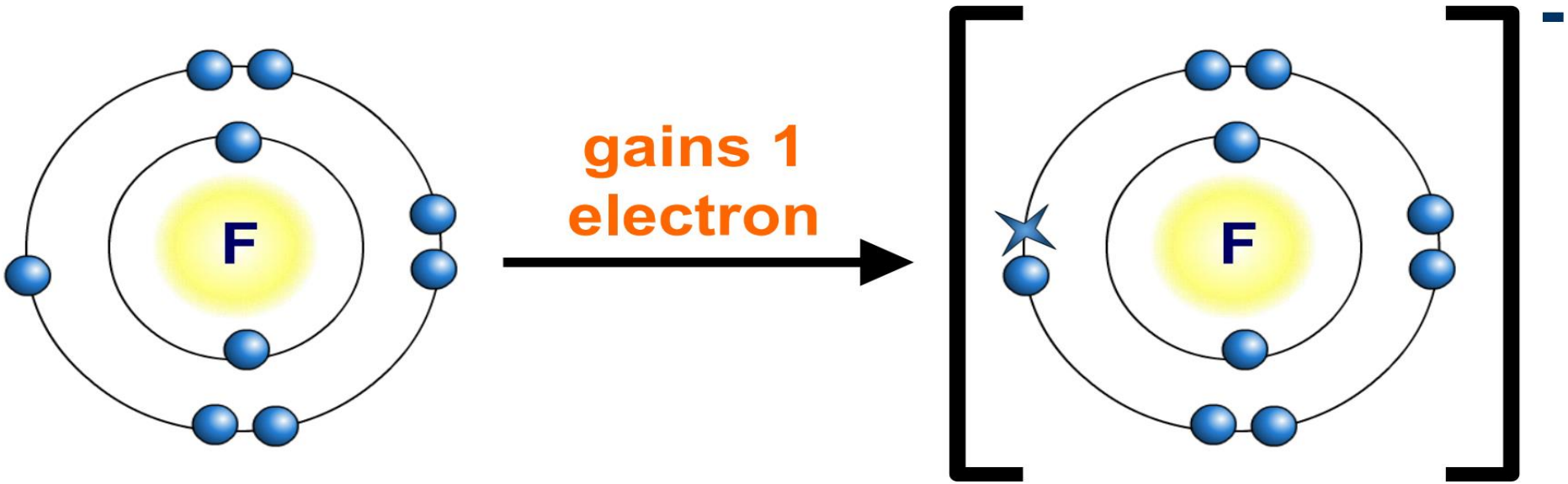
How is a fluoride ion formed?

Fluorine atom:

9 protons	=	+9
9 electrons	=	-9
Total charge	**=**	**0**

Fluoride ion:

9 protons	=	+9
10 electrons	=	-10
Total charge	**=**	**-1**



2.7
(partially full outer shell)

$[2.8]^-$
(full outer shell)

Simple Ions

Cations	Anions
Sodium – Na^{+}	Chloride – Cl^{-}
Magnesium – Mg^{2+}	Sulphate – SO_4^{2-}
Iron – Fe^{3+}	Carbonate – CO_3^{2-}
Copper – Cu^{2+}	Oxide – O^{2-}