

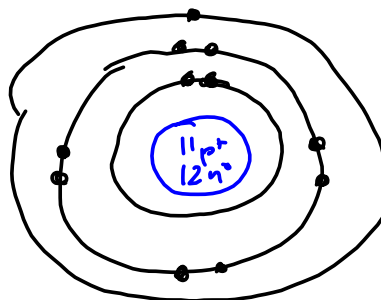
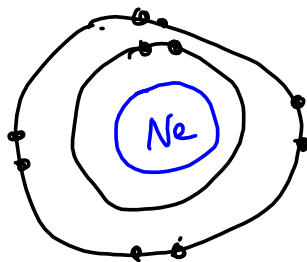
Warm Up



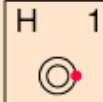







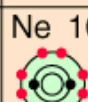








1. Draw a Bohr diagram of a neon atom.
2. Draw a Bohr-Rutherford diagram of a sodium atom.

10, Ne

11, 23 23 - 11 = 12



Bohr Diagrams for the first 18 elements

	1A	2A	3A	4A	5A	6A	7A	8A
n								He 2
1	H 1 							
2	Li 3 	Be 4 	B 5 	C 6 	N 7 	O 8 	F 9 	Ne 10 
3	Na 11 	Mg 12 	Al 13 	Si 14 	P 15 	S 16 	Cl 17 	Ar 18 

- 1) Each row adds an energy level (orbit)
- 2) Column 8 - all energy levels are full
- 3) In the other columns the number of electrons in the outer orbit are equal.

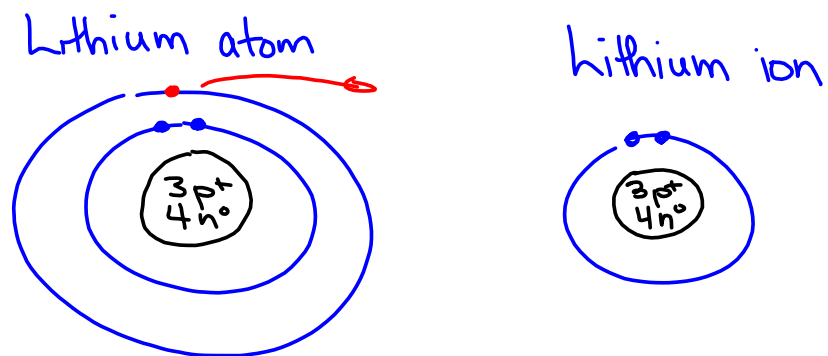
IONS

Ion - an atom that now has a positive or negative charge because it gained or lost a specific number of electrons.

So why do atoms gain or lose electrons?

- Elements want to have their outermost orbit filled with electrons (makes them stable) - lower energy
- Electron(s) will be gained or lost to do this.
- Protons are never gained or lost. (in chemical reactions)
- Electrons in the outer orbit are called valence electrons.
 - It is the number of valence electrons that determine how an element reacts with others

EX: Draw a Bohr-Rutherford diagram of a lithium atom.



What will it do to become a stable ion?

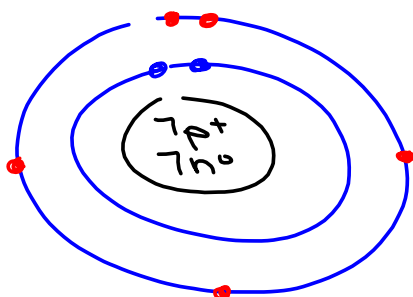
lose 1 e^- or gain 7 e^-

What is the ion's charge?

3 protons, 2 electrons
 $+3 - 2 = +1$

Li^+ (or Li^{+1})

EX: Draw a Bohr-Rutherford nitrogen atom.



What will it do to become a stable ion?

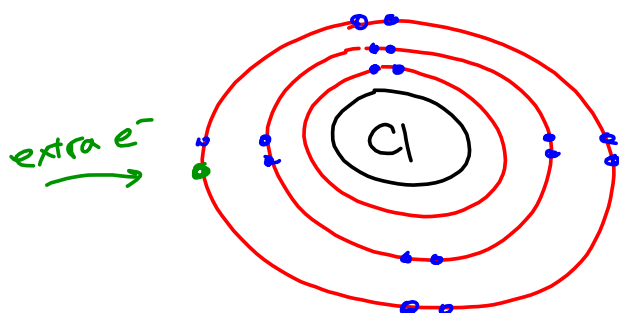
Lose $5e^-$ or gain $3e^-$

What is the ion's charge?

$7p^+$ and $10e^-$
 $+7 - 10 = -3$

EX: Draw a Bohr chlorine ion.

17, Cl



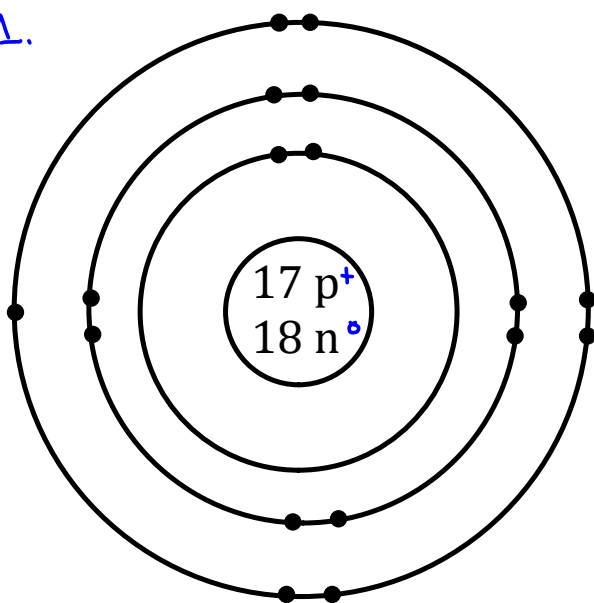
What did it do to become a stable ion?

Added 1 e⁻

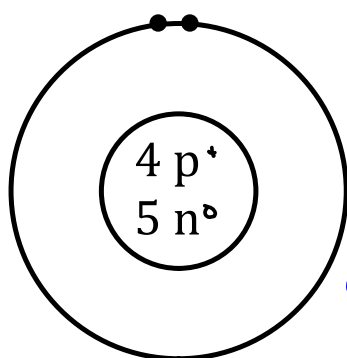
What is the ion's charge?

$$17p^+ \text{ and } 18e^- \\ 17(+1) + 18(-1) = \underline{\underline{-1}}$$

1.

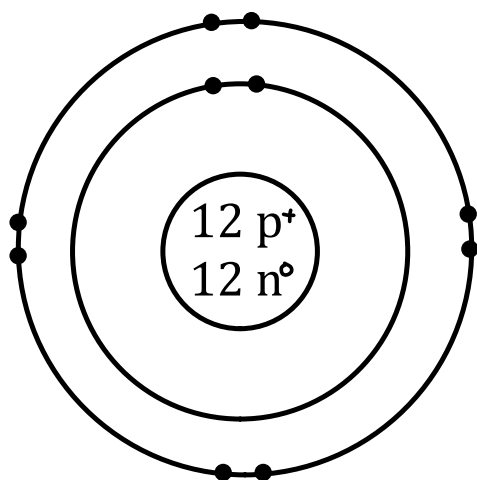
Element: Chlorine (Cl)# of orbits: 3# of valence electrons: 7Atom or ion: atomIon charge: —

2.



are the →
of e⁻
and p⁺ equal

Element: beryllium (Be)# of orbits: 1# of valence electrons: 2Atom or ion: ion
 Ion charge: $\frac{+4 + (-2)}{\begin{matrix} \uparrow & \uparrow \\ p^+ & e^- \end{matrix}} = +2$



Element: Mg

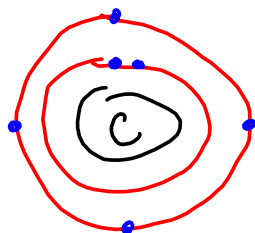
of orbits: 2

of valence electrons: 8

Atom or ion: ion

Ion charge: +12 + (-10) = +2

What about carbon?



We would need to
add $4e^-$ or remove $4e^-$

Both of these are actually
really hard to do.

Carbon (and some other elements) tend NOT to form ions, but react with other elements differently.

Classwork/Homework

Ion Diagrams worksheet