

## Warm Up



1. Draw a Bohr diagram of a neon atom.

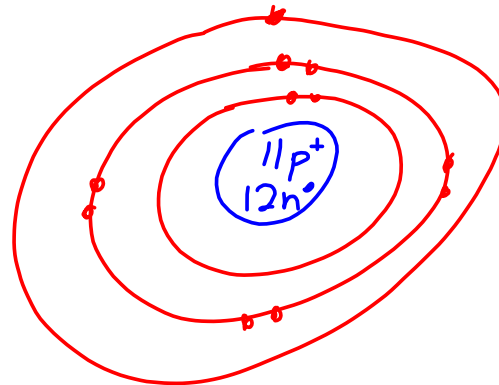
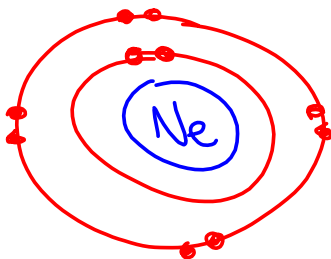
2. Draw a Bohr-Rutherford diagram of a sodium atom.

10, Ne



















11, 23

$23 - 11 = 12 n^{\circ}$

1.



## 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 has an extra energy level
- 2) The last column (8A) all elements have full outer levels
- 3) The number of outer electrons is the same in each of the other columns

# IONS

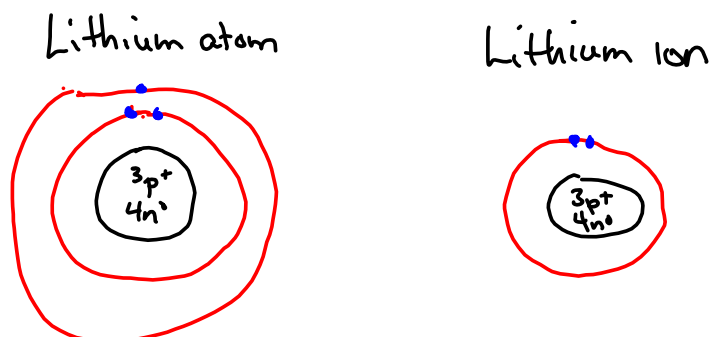
Ion - an atom that now has a positive or negative charge because it gained or lost a specific number of electrons.

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. - the number of valence electrons determines how the element reacts.

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

$$7 - 3 = 4n'$$



What will it do to become a stable ion?

Add  $7e^-$  or take away  $1e^-$  ← this is (a lot) easier

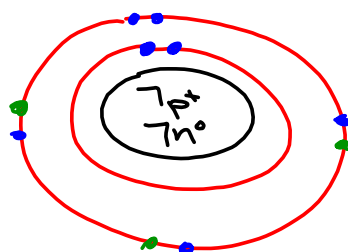
What is the ion's charge?

$$3p^+ \text{ and } 2e^-$$

$$3(+1) + 2(-1) = +1$$

EX: Draw a Bohr-Rutherford nitrogen atom.

7, 14



What will it do to become a stable ion?

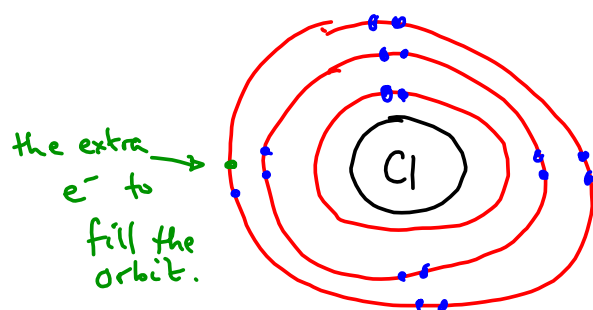
add  $3e^-$  or remove  $5e^-$

What is the ion's charge?

$7p^+$  and  $10e^-$   
 $7(+1) + 10(-1) = -3$

EX: Draw a Bohr chlorine ion.

17, Cl



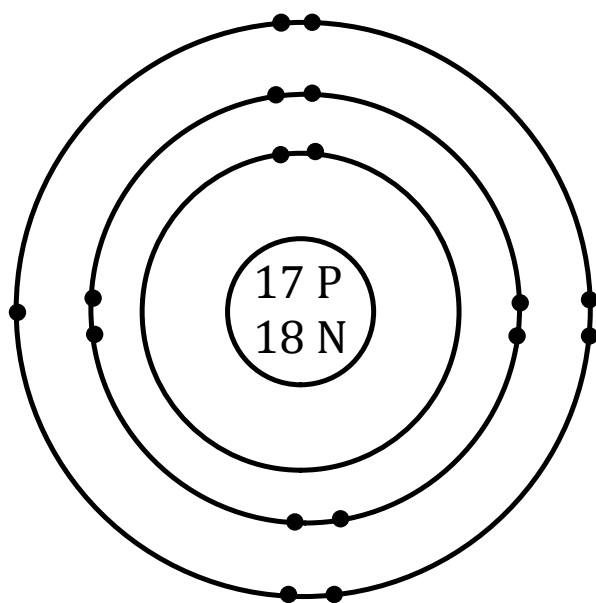
What did it do to become a stable ion?

Add 1  $e^-$

What is the ion's charge?

$$17p^+ + 18e^-$$
$$17(+1) + 18(-1) = -1$$





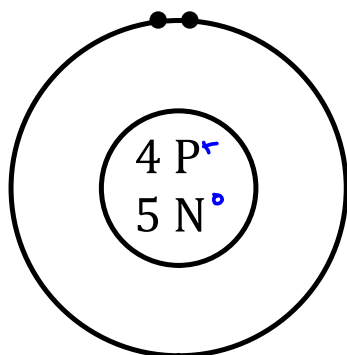
Element: Chlorine

# of orbits: 3

# of valence electrons: 7  
(outer level)

Atom or ion: atom

Ion charge: —



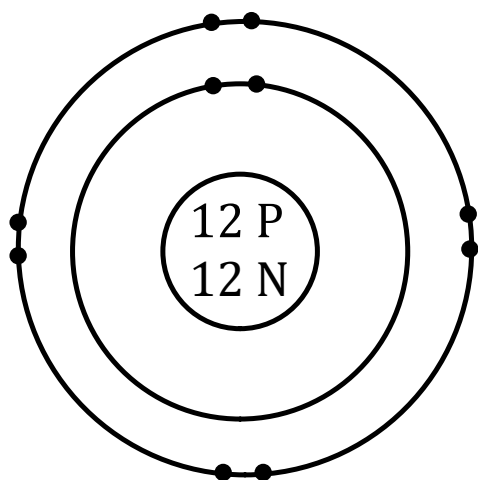
Element: beryllium

# of orbits: 1

# of valence electrons: 2

Atom or ion: ion

Ion charge: +4 + -2 = +2



Element: Mg

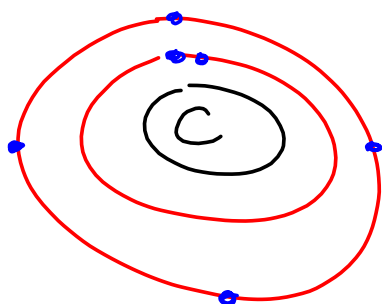
# of orbits: 2

# of valence electrons: 8

Atom or ion: ion

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

What about carbon?



add  $4e^-$   
or remove  $4e^-$

hard to do either  
of these. Carbon  
(and a few other elements)  
tends NOT to form ions.

Classwork/Homework

Ion Diagrams worksheet