

Periodic Table Part 2

Lewis Notation

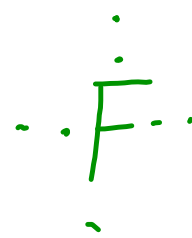
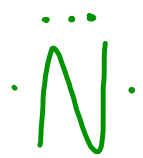
- Dots are used to show the number of valence electrons an element has.
- All elements in the same group have the same Lewis notation.
- Dots are put in the 4 compass points (N, E, S and W).
- You cannot double up on a compass point until each point has a dot. **No compass points should have more than 2 dots.**

I	II	III	IV	V	VI	VII	0
H •							He •
Li • •	Be • •	B • •	C • •	N • •	O • •	F • •	Ne • • • •
Na • •	Mg • •	Al • •	Si • •	P • •	S • •	Cl • •	Ar • • • •
K • •	Ca • •	Ga • •	Ge • •	As • •	Se • •	Br • •	Kr • • • •
Rb • •	Sr • •	In • •	Sn • •	Sb • •	Te • •	I • •	Xe • • • •
Cs • •	Ba • •	Tl • •	Pb • •	Bi • •	Po • •	At • •	Rn • • • •

Metal
 Metalloid
 Nonmetal



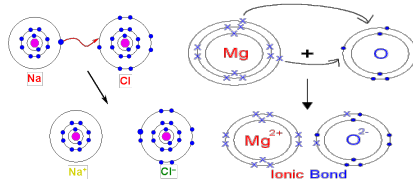
Incorrect:



Ions

Def: Are charged atoms.

- they could be positively or negatively charged.
- they become charged by **gaining or losing electrons.**
- all elements in the same family have the same ion charge.
- metalloids will follow the family rule.



When an element donates or accepts electrons they will form a compound and become stable.

Metals:

- Groups 1, 2 and 3.
- Donate electrons to non metals and form positive ions.

Group 1	Group 2	Group 3
Na (1pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \end{array}$ after $11pt + 10e = 10n$	Mg (2pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \end{array}$ after $12pt + 10e = 10n$	Al (3pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \end{array}$ after $13pt + 10e = 10n$
Charge? +1	+2	+3
Why? donated 1e so have an extra pt.	donated 2e so have 2 extra pt	donated 3e so have 3 extra pt

Non-Metals:

- Groups 4-8
- Accept electrons from metals and form negative ions.

Group 4	Group 5	Group 6	Group 7
Si (4pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \\ 4 \end{array}$ after $14pt + 18e$	P (5pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \\ 5 \end{array}$ after $15pt + 18e$	S (6pt) $\left. \begin{array}{l} \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \\ \text{)} \end{array} \right\} \begin{array}{l} 2 \\ 8 \\ 6 \end{array}$ after $16pt + 18e$	
Charge? -4	-3	-2	-1
Why? accepted 4e	accepted 3e	accepted 2e	accepted 1e

Group 8

Does not form ions. Why?

Beacuse their orbits are full and are therefore already a stable atom.

+1	+2		+3	+4	-3	-2	-1	0			
IA	IIA		IIIA	IVA	VA	VIA	VIIA	VIIIA			
X							H	He			
3	4		5	6	7	8	9	10			
Li	Be		B	C	N	O	F	Ne			
11	12		13	14	15	16	17	18			
Na	Mg		Al	Si	P	S	Cl	Ar			
19	20	21	22	29	30	31	32	33	34	35	36
K	Ca	Sc	Ti	Cu	Zn	Ga	Ge	As	Se	Br	Kr
37	38	39	40	47	48	49	50	51	52	53	54
Rb	Sr	Y	Zr	Ag	Cd	In	Sn	Sb	Te	I	Xe
55	56	57	72	79	80	81	82	83	84	85	86
Cs	Ba	La	Hf	Au	Hg	Tl	Pb	Bi	Po	At	Rn
87	88	89	104	111	112			114		116	
Fr	Ra	Ac	Rf								118

Past exam questions

1. Which atom is correctly represented with the Lewis notation?

A)



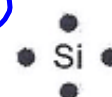
B)



C)



D)



2. During ionization, an atom can become a positive ion. How does an atom become a positive ion?

A) It gains one or more electrons

B) It loses one or more electrons

C) It gains one or more protons

D) It loses one or more protons