

Certain Elements Form Ions!!!

- Ion: A non-neutral atom
 - Cation: A positive ion - lose electron
 - Anion: A negative ion - gain electrons.



Cation
cat·i·on

Pronunciation: [kat-ahy-uh n, -on]
-noun, Chemistry
1. An ion with a paws-itive charge.
2. The cutest ion ever.

When an atom gains one or more electrons it becomes **negative** -



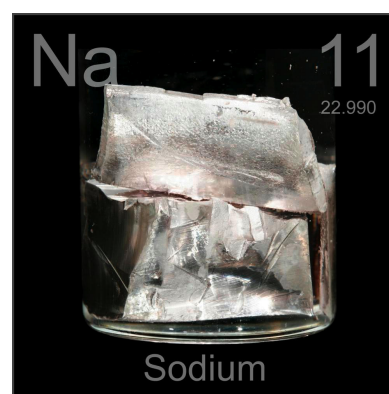
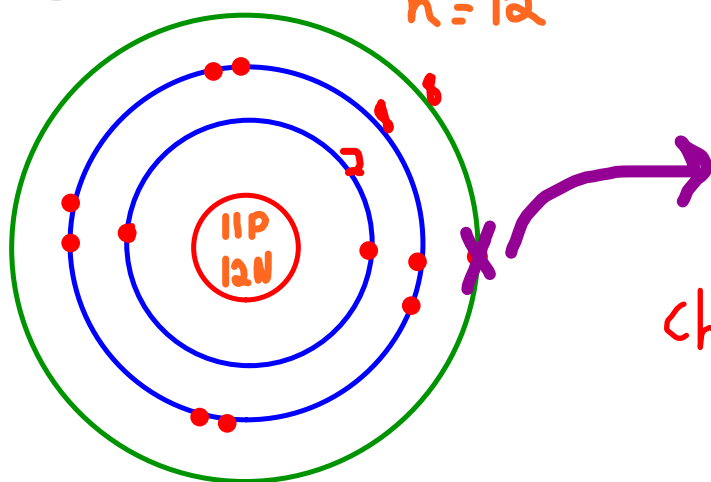
called an **anion** ("an-eye-on")

Cation

- Metals that LOSE electrons to get a full outer shell.

> Ex:

$$\begin{aligned}\text{mass} &= p + n \\ 23 &= 11 + n \\ n &= 12\end{aligned}$$



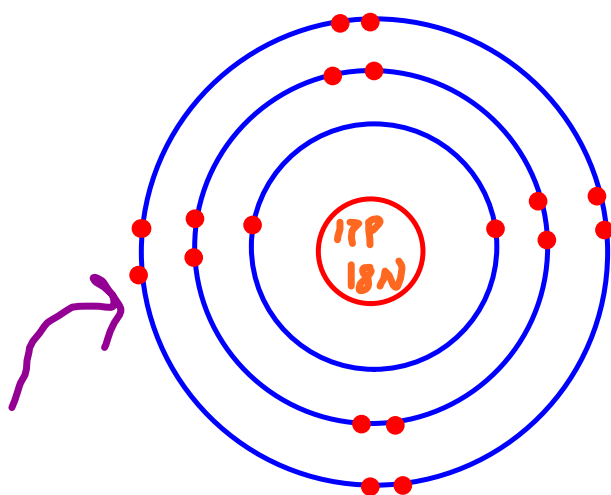
$$\begin{aligned}\text{charge} &= p - e \\ &= 11 - 10 \\ &= +1\end{aligned}$$

Anion

- Nonmetals that *GAIN* electrons to get a full outer shell.

> Ex:

$$\begin{aligned}\text{mass} &= p + n \\ 35 &= 17 + n \\ n &= 18\end{aligned}$$



$$\begin{aligned}\text{charge} &= p - e \\ &= 17 - 18 \\ &= -1\end{aligned}$$

Periodic Trends

- **Groups:** vertical columns - elements share same properties because same # ve / ion charges!

THE PERIODIC TABLE OF ELEMENTS

GI 2ve

+3 -3 -2 -1
3ve 4ve 5ve 6ve 7ve 8ve

1 H HYDROGEN 1.008	2 He HELIUM 4.003																	
3 Li LITHIUM 6.941	4 Be BERYLLIUM 9.012	5 B BORON 10.811	6 C CARBON 12.011	7 N NITROGEN 14.007	8 O OXYGEN 15.999	9 F FLUORINE 18.998	10 Ne NEON 20.180											
11 Na SODIUM 22.990	12 Mg MAGNESIUM 24.305	13 Al ALUMINIUM 26.982	14 Si SILICON 28.086	15 P PHOSPHORUS 30.974	16 S SULFUR 32.065	17 Cl CHLORINE 35.453	18 Ar ARGON 39.948											
19 K POTASSIUM 39.098	20 Ca CALCIUM 40.078	21 Sc SCANDIUM 44.956	22 Ti TITANIUM 47.867	23 V VANADIUM 50.942	24 Cr CHROMIUM 51.996	25 Mn MANGANESE 54.938	26 Fe IRON 55.845	27 Co COBALT 58.933	28 Ni NICKEL 58.693	29 Cu COPPER 63.546	30 Zn ZINC 65.382	31 Ga GALLIUM 69.723	32 Ge GERMANIUM 72.640	33 As ARSENIC 74.922	34 Se SELENIUM 78.971	35 Br BROMINE 79.904	36 Kr KRYPTON 83.798	
37 Rb RUBIDIUM 85.468	38 Sr STRONTIUM 87.621	39 Y YTTRIUM 88.906	40 Zr ZIRCONIUM 91.224	41 Nb NI OBIUM 92.906	42 Mo MOLYBDENUM 95.941	43 Tc TECHNETIUM (97.907)	44 Ru RUTHENIUM 101.072	45 Rh RHODIUM 102.906	46 Pd PALLADIUM 106.421	47 Ag SILVER 107.868	48 Cd CADMIUM 112.404	49 In INDIUM 114.818	50 Sn TIN 118.710	51 Sb ANTIMONY 121.760	52 Te TELLURIUM 127.603	53 I IODINE 126.904	54 Xe XENON 131.294	
55 Cs CAESIUM 132.905	56 Ba BARIUM 137.327	E57-71		72 Hf HAFNIUM 178.492	73 Ta TANTALUM 180.948	74 W TUNGSTEN 183.841	75 Re RHENIUM 186.207	76 Os OSMIUM 190.233	77 Ir IRIDIUM 192.227	78 Pt PLATINUM 195.084	79 Au GOLD 196.967	80 Hg MERCURY 200.592	81 Tl THALLIUM 204.383	82 Pb LEAD 207.210	83 Bi BISMUTH 208.980	84 Po POLONIUM (209)	85 At ASTATINE (210)	86 Rn RADON (222)
87 Fr FRANCIUM (223)	88 Ra RADIUM (226)	E89-103		104 Rf RUTHERFORDIUM (261)	105 Db DBYLIUM (262)	106 Sg SEABORGIUM (266)	107 Bh BOHRIUM (264)	108 Hs HASSIUM (277)	109 Mt MEITNERIUM (268)	110 Ds DARMSTADIUM (285)	111 Rg ROENTGENIUM (289)	112 Cn COPECHEVNIUM (285)	113 Nh NIHONIUM (286)	114 Fl FLEHVIUM (289)	115 Mc MOSCOWIUM (289)	116 Lv LIVERMORIUM (293)	117 Ts TENNESSINE (294)	118 Og OGANESSON (294)
57 La LANTHANUM 138.905	58 Ce CERMIUM 140.116	59 Pr PRASEODYMIUM 140.908	60 Nd NEODYMIUM 144.242	61 Pm PROMETHIUM (144.913)	62 Sm SAMARIUM 150.362	63 Eu EUROPEIUM 151.964	64 Gd GADOLINIUM 157.252	65 Tb TERBIUM 158.925	66 Dy DYSPROSIUM 162.502	67 Ho HOLEMIUM 164.930	68 Er ERBIUM 167.259	69 Tm THULMIUM 168.934	70 Yb YTTERIUM 173.054	71 Lu LUTETIUM 174.967				
89 Ac ACTINIUM (227)	90 Th THORIUM (232)	91 Pa PROTACTINIUM (231)	92 U URANIUM (238)	93 Np NEPTUNIUM (237)	94 Pu PLUTONIUM (244)	95 Am AMERICIUM (243)	96 Cm CURMIUM (247)	97 Bk BERKELEIUM (247)	98 Cf CALIFORNIUM (251)	99 Es EBERHARDIUM (252)	100 Fm FERMIIUM (257)	101 Md MENDELIUM (288)	102 No NOBELIUM (289)	103 Lr LAWRENCIUM (262)				

© Andy Brunning/Compound Interest 2017 - www.compoundchem.com | Facebook: facebook.com/compoundchem | Twitter: @compoundchem
This graphic is shared under a Creative Commons 4.0 Attribution-NoDerivatives-NonCommercial licence.