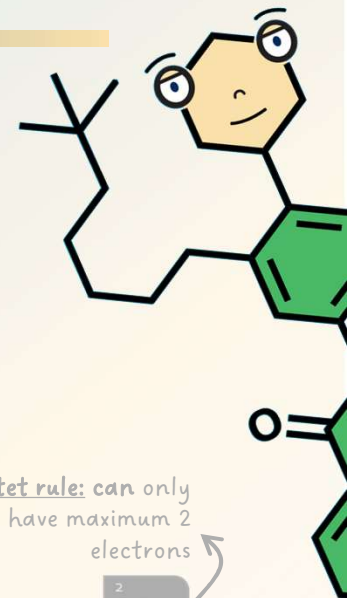


Octet Rule



The octet rule states that **atoms gain, lose, or share electrons to achieve a stable configuration with eight electrons in their valence shell**. It only applies to atoms whose valence electrons are located in *s* and *p* orbitals (because *s* orbitals can take a maximum of 2 electrons, and *p* orbitals a maximum of 6 electrons, $2 + 6 = 8$). Atoms with valence electrons in *d* and *f* orbitals, do not follow the octet rule.

☒ **octet rule:** can only have maximum 2 electrons

1 H Hydrogen	
3 Li Lithium	4 Be Beryllium
11 Na Sodium	12 Mg Magnesium
19 K Potassium	20 Ca Calcium
37 Rb Rubidium	38 Sr Strontium
55 Cs Cesium	56 Ba Barium
87 Fr Francium	88 Ra Radium

☑ **octet rule**
s-block elements follow the octet rule by losing their *s* electrons and revealing an underlying octet

☒ **octet rule**
p-block elements usually follow the octet rule, but the presence of empty *d*-orbitals allows them to sometimes exceed the octet rule

☑ **octet rule**

Top p-block elements and noble gases ALWAYS follow the octet rule

☒ **octet rule:** can only have maximum 2 electrons

5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson

☒ **octet rule**

These elements have valence electrons in *d* or *f* orbitals, and thus do not follow the octet rule

57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium