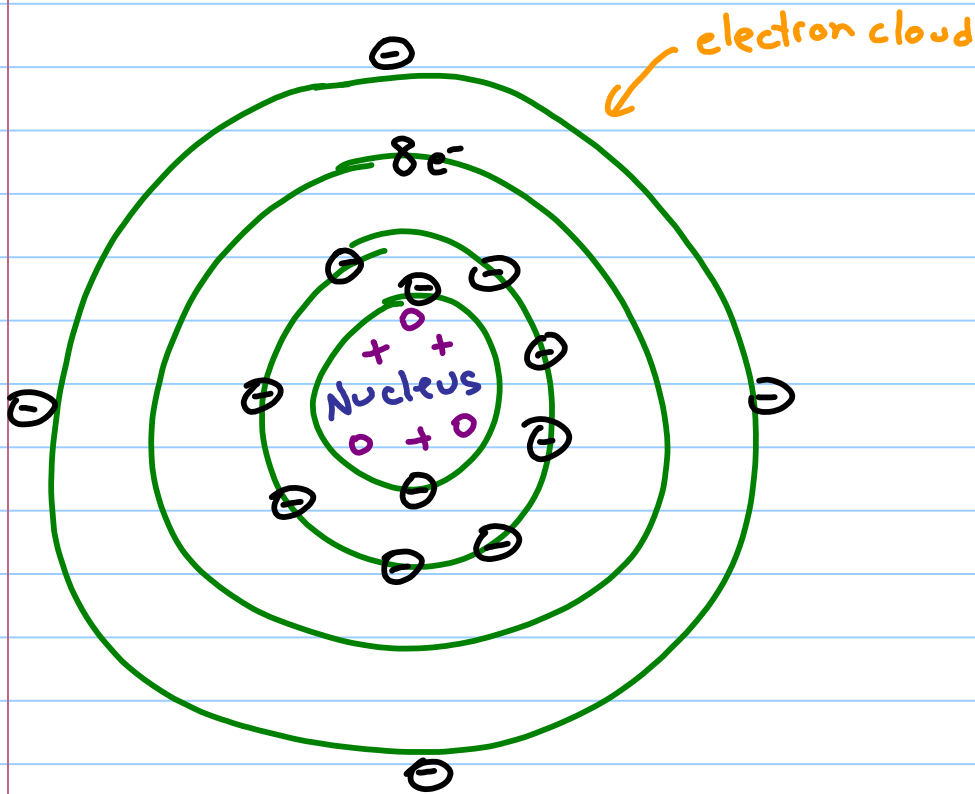


Gen chem Review
for incoming Orgo Students

Atom



Nucleus
protons $q = +1$
 $m = 0$

neutrons $q = 0$
 $m = 1$

e⁻ cloud
electrons $q = -1$
 $m \approx 0$

protons = identity = fixed

electrons = protons neutral

$e > p = \underline{\text{anion}}$ neg }
 $e < p = \text{cation}$ pos }

neutrons → isotope ← to identify atoms (spec)

Hydrogen	p		n	m
(protium)	1	+	0	1
deuterium	1	+	1	2
(tritium)	1	+	2	3

↓ group

$F = 1s^2 \underbrace{2s^2 2p^5}_{\text{valence}}$

$S = 1s^2 2s^2 2p^6 \underbrace{3s^2 3p^4}_{\text{valence}}$

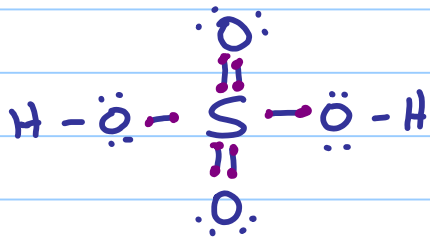
→ period

1	2											8					
1	2											2					
1	2											2					
3	4											10					
11	12											18					
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

S orbital hold up to 2 e⁻
 p " " " " 6 e⁻

octet rule = ideal full outer shell
 full = 8



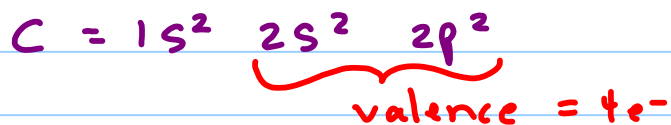
larger atoms can d orbital for $>8 e^-$

ex. S, P, Cl

small atoms like <8

$$H + He = 2$$

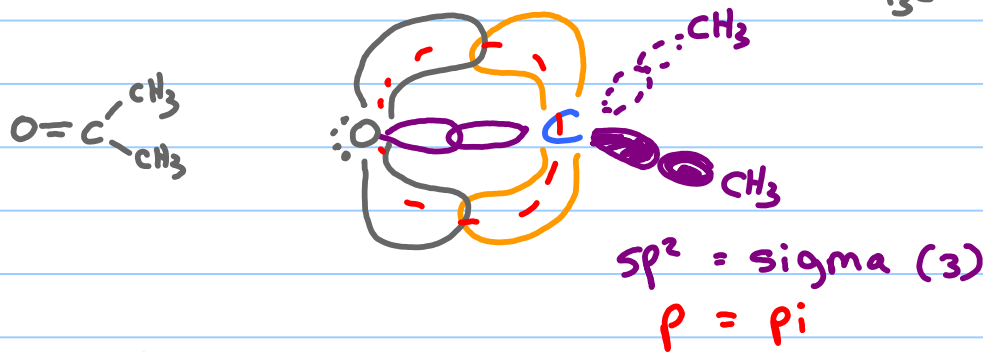
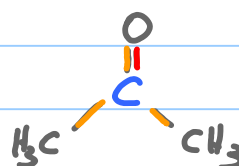
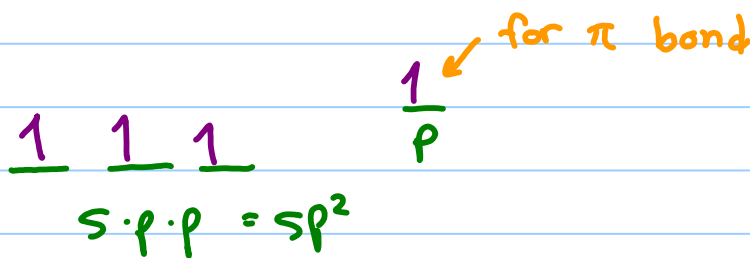
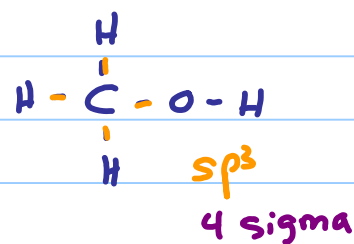
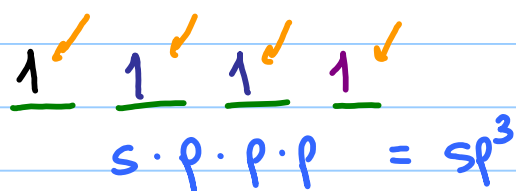
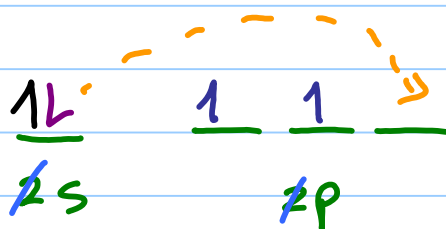
$$B = 6$$



C likes 4 bonds



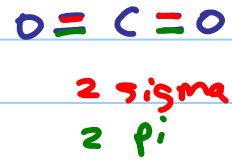
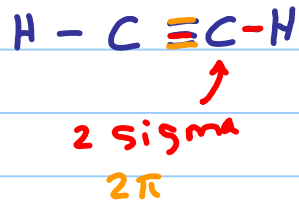
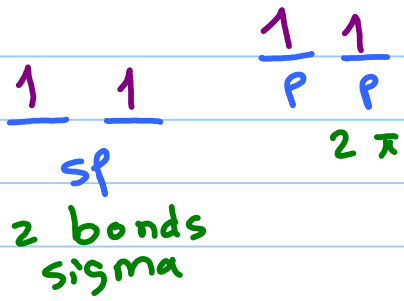
Hybridization



A - B
↗
in plane of page

A B
B = out of page

A B
B = into page



Trick = look at number of groups

groups



electron geometry

tetrahedron

Flat
trigonal planar

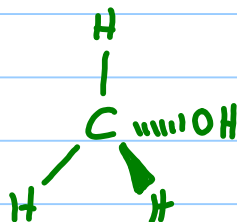
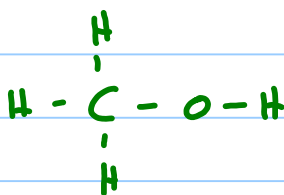
linear

bond angle

109.5

120°

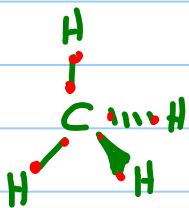
180°



EG electron geometry = looking at e⁻

MG molecular geometry = molecule itself
only see atoms
not electrons

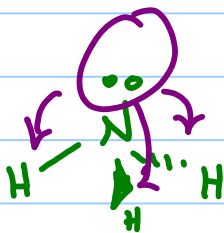
CH₄



EG = tetra

MG = tetra

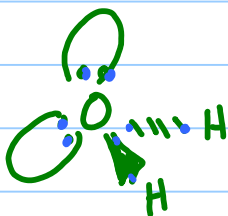
NH₃



EG = 4 groups = tetrahedron

MG = 3 atoms = trigonal pyramidal

H₂O



EG = 4 groups = tetrahedral

MG = 2 atoms = bent