LEWIS STRUCTURES

2-D Drawings of Molecules
Show - how atoms Connected
- where electrons are
shared e^- = bonds
unshared e^- = lone pairs

① Lewis Rules
② Guidelines
③ Examples
Chemistrysky.com

Lewis Rules

① Total # e^- = sum of valences
valence e^- include Sep in outermost shell
(+ charge)

② Octet Rule: every atom ends up with 8 e^- (4 pairs)
except H - which gets 2 e^- (1 bond)

— single bond - 2 shared e^-
= double " 4 " "
≡ triple " 6 " "
} Count toward both Octets

.. lone pair 2 unshared e^-
~ count for 1 Octet

Lewis Guidelines for Connecting Atoms

Atom	Group	Valence	# bonds	e⁻ dot	
H	1	1	1 ALWAYS	H·	outside
F, Cl, Br, I	17 (7A)	7	1 (usually)	:Cl·	outside
O, S, Se	16 (6A)	6	2	·Ö·	
N, P	15 (5A)	5	3	·N·	middle
C, Si	14 (4A)	4	4 ALWAYS	·C·	middle

No O–O Bonds (except Peroxides)
In polyatomic ions, O on outside

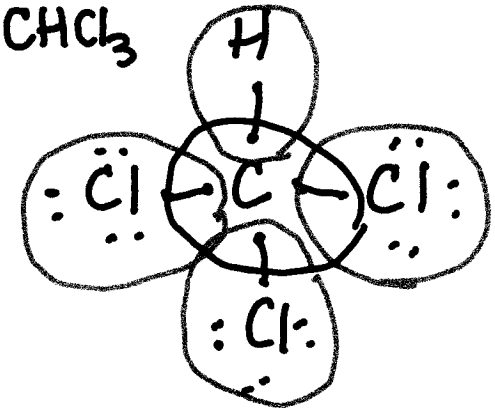
Rule: Use pencil

Examples

Connect Dots

Draw, Octet, Count

① $CHCl_3$



② OH^-

$$\left[:\ddot{O}-H \right]^-$$

$$\left[:\ddot{O}-H \right]^-$$

$6 + 1 + 1 = 8$

③ NO_3^-

$$\left[:\ddot{O}-N=\ddot{O}: \right]^-$$
$$:\ddot{O}:$$

$$:\ddot{O}-N=\ddot{O}:$$
$$:\ddot{O}:$$

Valence: $5 + 3(6) + 1 =$ 24