Chemistry 2

- iClicker 9A
- Covalent Bonds
  - single, double, triple
  - charge!
  - Abbreviations
- Answer to iClicker 9B

- Due in Lab next week
  - Pre-Lab 4
  - LEGO Meiosis lab report

- Register your iClicker
-
- Exam Information

- Last names starting with A through E
  - 11th Floor of Healy
- Last names starting with F through Z
  - Lipke (here)

Covalent Bond 2 e^- are shared by 2 atoms

ex. $H\cdot + \cdot H \longrightarrow H:H$

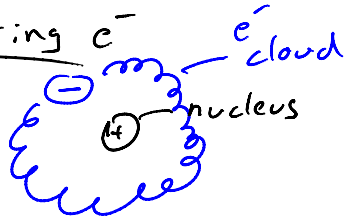
→ 2 shared e^- = covalent bond

→ both atoms "happy" because their outer shells are filled

alone → H atoms are not "happy"

→ outer shells are not full

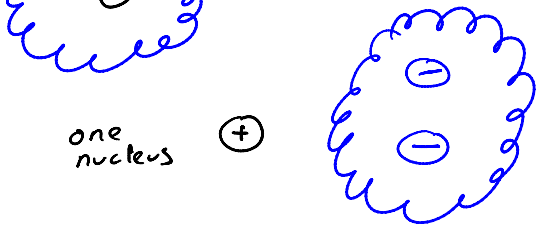
Details of sharing e^-



$H\cdot$ =

covalent bond

$H-H$ =



- e^- spends most of their time between nuclei
- (−) charged cloud in between nuclei
- pulls (+) nuclei together → forms covalent bond

$H-H$ or H_2

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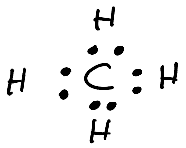
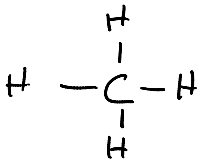
example

$\cdot\dot{C}\cdot + 4\,H\cdot \longrightarrow$ 

now, all H's have 2 e^- in their o.s.

C has 8 e^- in its o.s.

→ all atoms are "happy"



or CH_4 → methane gas

cow fart

$\cdot\ddot{N}\cdot + 3\,H\cdot \longrightarrow$ 

NH_3

ammonia

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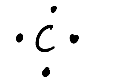
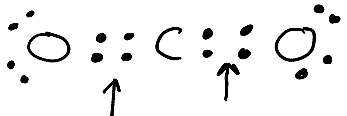
ex. CO_2

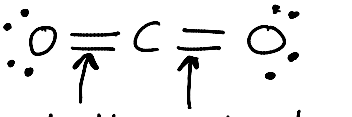


→ wants to make 4 covalent bonds

2 

→ wants to make 2 covalent bonds



$\Rightarrow$ 

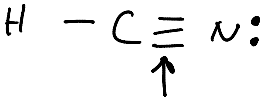
4 e^- are shared

double covalent bond

double covalent bond is stronger than a single covalent bond

H C N → hydrogen cyanide

1 4 3 (# bonds)



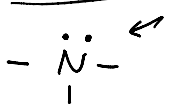
triple covalent bond → 6 e^- shared

Exceptions to # of bonds → due to interactions with water

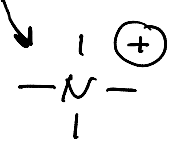
in Bio III → oxygen & nitrogen

$H^{\bullet} \longrightarrow H^+ + e^-$

Nitrogen



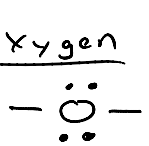
or



3 covalent bonds
1 lone pair
no charge

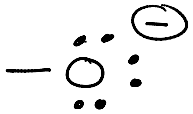
4 covalent bonds
no lone pair
single, positive charge

Oxygen



e^-

or



2 covalent bonds
2 lone pair
no charge

1 covalent bond
3 lone pair
single, negative charge

equals 

$+e^-$ → 

if e^- is removed from H, call this a proton

Abbreviations

① "—" → single covalent bond

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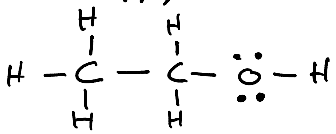
= → double

≡ → triple

② bonds are implied where necessary to make the atoms "happy"

ex. H_3CCH_2OH



ethyl alcohol → beer & wine

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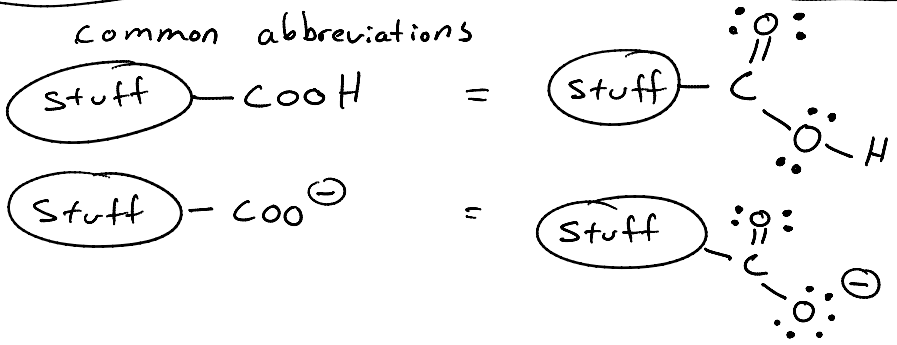
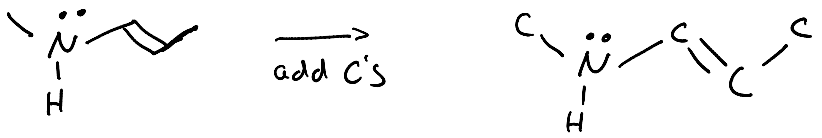
common abbreviations



③ corners, vertices, & end of lines are C atoms

H's implied on C atoms where its necessary to make atoms "happy"

ex.



add H's