

Chemical Bonds

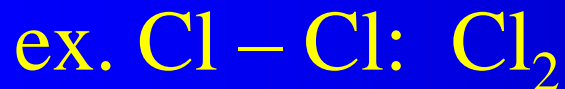
Covalent Bonds

■ Definition

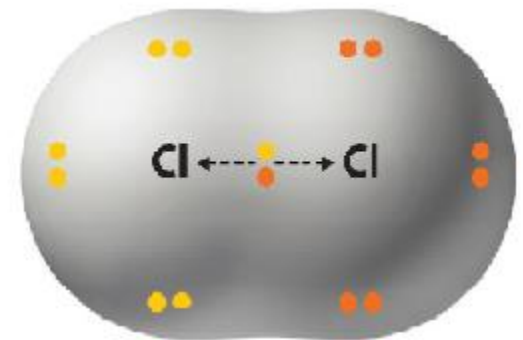
- chemical bond in which two atoms share valence electrons
- always formed between two nonmetals
- mostly low melting/boiling points
- non-conductive
- 2 types of bonds
 - polar
 - non polar

Non Polar bonds

- Non Polar
 - bonded atoms that share electrons (e^-) equally.
 - atoms of the same element bonded together



- insoluble in water
(will not dissolve)



Nonpolar covalent bond

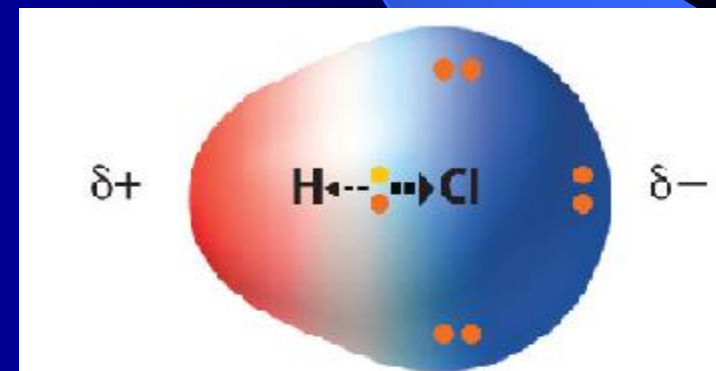
Bonding electrons shared equally between two atoms.
No charges on atoms.

Polar bonds

- bonded atoms that do not share electrons (e^-) equally.
- atoms of different elements bonded together.

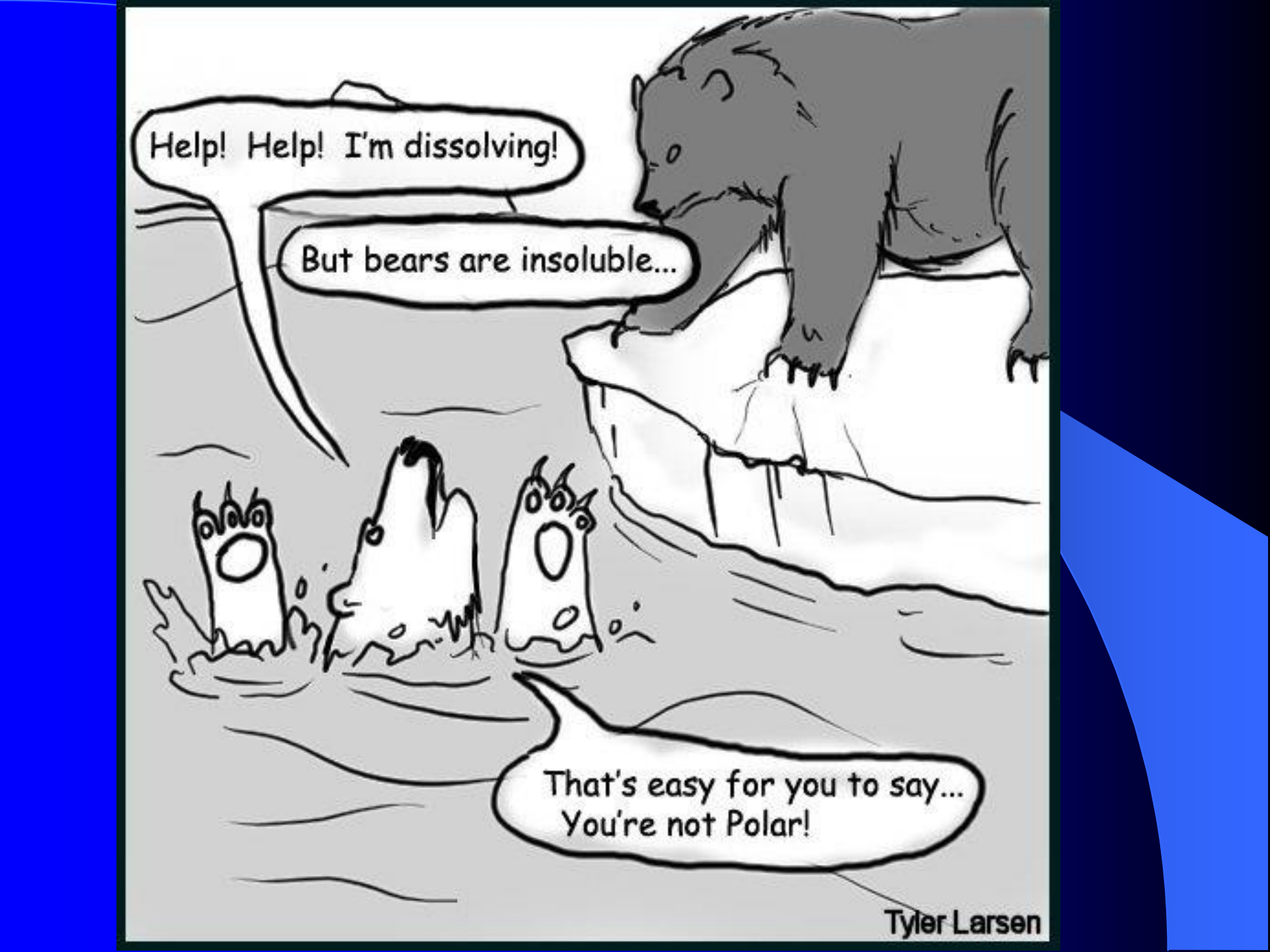
ex. H – Cl

- The Cl atom has a much larger nucleus than the H atom, and therefore has a stronger pull on the shared electron than the H atom, causing the Cl end of the molecule to be $-$, and the H end $+$.
- Water soluble
(will dissolve in water.)



Polar covalent bond

Bonding electrons shared unequally between two atoms. Partial charges on atoms.

A black and white cartoon illustration. On the right, a large bear is perched on a piece of ice, looking towards the left. In the water below, three polar bear paws are sticking up, looking distressed. Three speech bubbles are present: one from the paws, one from the bear on the ice, and one from the paws at the bottom.

Help! Help! I'm dissolving!

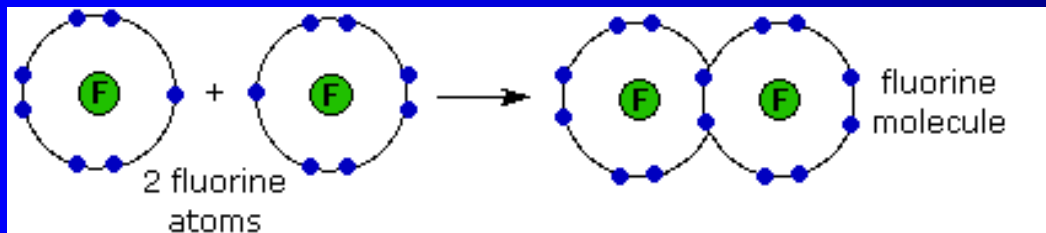
But bears are insoluble...

That's easy for you to say...
You're not Polar!

Tyler Larsen

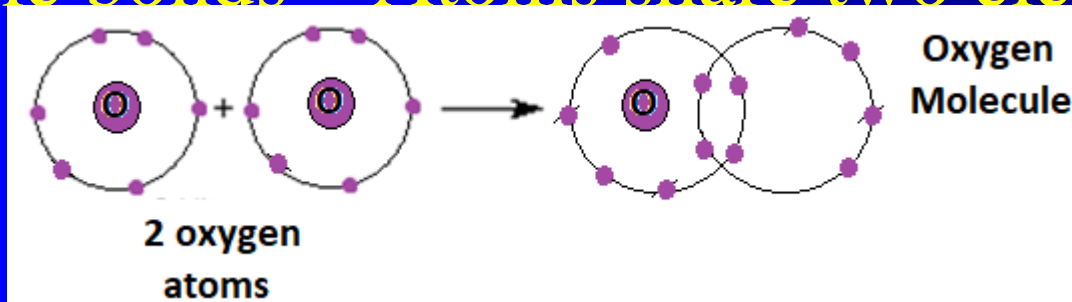
Types of Bonds

Single bonds - Atoms can share one electron.

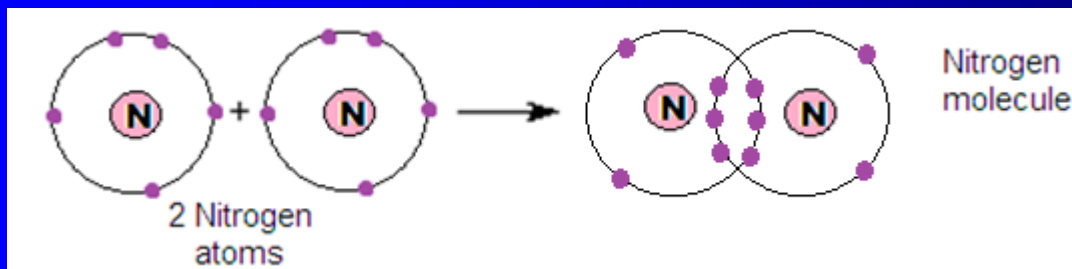


Easiest
to break

Double bonds – Atoms share two electrons.



Triple bonds – Atoms share three electrons.



Hardest
to break

Naming Covalent Compounds

- Prefix System

of atoms

prefix

1

mono

2

di

3

tri

4

tetra

5

penta

6

hexa

7

hepta

8

octa

9

nona

10

deca

Naming Covalent Compounds Cont.

- Rules for the prefix system

1. The first element is only given a prefix if there is more than one atom of it in the molecule.

2. The second element is name combines a prefix indicating the number of atoms to the name of the second element ending with the suffix -ide

-The o or a at the end of a prefix is usually dropped when the word following the prefix begins with another vowel

ex. Monoxide or pentoxide

Naming Covalent Compounds Cont.

Naming covalent compounds from formula



Silicon dioxide



Phosphorus tribromide



Carbon tetr iodide



Dinitrogen trioxide

Writing Formulas for Covalent Compounds

- Writing formulas from names

1. Carbon Dioxide



2. Dinitrogen Pentoxide



3. Triphosphorus monosulfide



4. Sulfur Monobromide

