Shengbin Jia

12725

22 Jan, 2020

1.

	Carbon	Nitrogen	Sulfer	Br
Valence electrons	4	5	6	7
Bonds in organic	4	3	2	1

Examples	Methylamine	Ethanol	Methanethiol
Lewis Structure			

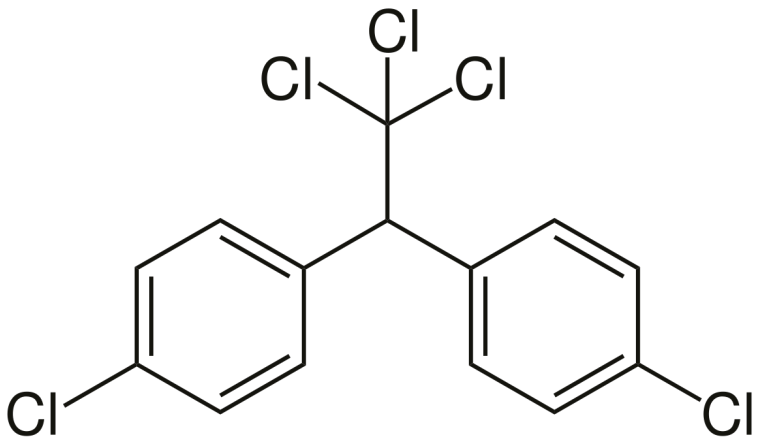
2.

There are some approaches to describe the structure of a given compounds:

I. specify the elements it contains, or its elemental composition.
II. specify how many atoms of each of element are present in one molecule
III. calculate the molecular mass or molecular weight of the compound
IV. Determine whether all atoms in this compound are stable isotopes
V. Determine whether it has isomers
VI. If yes, then specify the connectivity, which is commonly referred to as the structure of the compound
VII. Determine whether is has stereoisomers

Structural isomers are molecules that have the same molecular formula but with the atoms connected in a different order.

3.



4.

Compound classes	(i) Polyaromatic hydrocarbons	(i) Chlorophenols	(i) Amines
IUPAC name	anthracene	2-Chlorophenol	1,2-diaminoethane
Structure			
Compound classes	(i) Organohalides	(i) Perfluorinated alkane sulfonates	
IUPAC name	Thichloroethylene	pentadecafluorooctanoic acid	
Structure			

5.

Aploar: The apolar compounds interact chiefly by cdW forces.

Example : CH_4

Monopolar: The bipolar compounds have in addition either H-donor (electron acceptor) or H-acceptor (electron donor) properties.

Example: CH_3CHO

Bipolar:, The bipolar compounds exhibit both, which means have both H-donor (electron acceptor) or H-acceptor (electron donor) properties.

Example: CH_3CH_2OH

6.

	Ethanol	Ethoxyethane	Hydrogen sulfide	Ehylamine
Pure liquids or gas	vdW	vdW	vdW, hd	vdW
Dissolve in water	vdW, hd	vdW	cdW, hd	vdW, hd

* vdW = van der Waals / hd = hydrogen bond

7.

Although H-O is less polar than H-F bonds, Each HF molecule possesses 3 lone pairs on F and 1 H. HF molecules on average make 2 H-bonds, on the other side, Each H2O molecule possesses 2 lone pairs on O and 2 H. H2O molecules are thus able to form an average of 4 H-bonds, which is twice than HF do, thus H2O has a higher boiling point than HF because it contains twice as many H-bonds, despite these being individually weaker. As compression between HF and NH3, although they both contains 2 H-bonds in average, fluorine is more electronegative than nitrogen, the H-F bonds are much more polar than the N-H bonds. Due to the higher partial charges on H and F in HF, a hydrogen bond between HF molecules is stronger than that between NH3 molecules. The higher boiling point of HF is thus due to stronger H-bonds.

8. **Functional groups** are specific groupings of atoms within molecules that have their own characteristic properties, regardless of the other atoms present in a molecule.

i. Alcohols : the covalent bonds of this functional group are polarized so that oxygen is electron rich and both carbon and hydrogen are electrophilic which is more likely to form hydrogen bond to lower the boiling point of alcohols organic matters.

ii. Amines: Amines are able to from hydrogen bonds, but the but lower than those of the corresponding alcohols, which hydrogen bond to a stronger extent. however, lower than those of the corresponding alcohols, which hydrogen bond to a stronger extent. Amines also display some solubility in water. However, the solubility decreases with an increase in carbon atoms, due to the increased hydrophobicity of the compound as the chain length increases.

iii. Ketones: Ketones organic matters usually can be infinitely mixed with water, since the highly polar represented by oxygen atom. Thus when it dissolve into water, forming hydrogen bonds increases greatly the solubility of ketones organic matters, thats reason why ketones is used as a industry solvent.

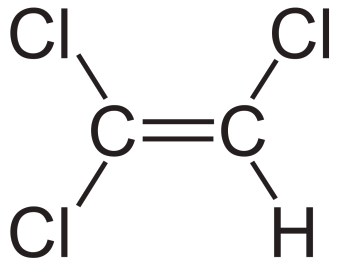
9.

	BDE-47	BDE-100
IUPAC name	2,4-dibromo-1-(2,4-dibromophenoxy)benzene	1, 3, 5-Tribromo-2-(2, 4-dibromophenoxy)benzene
Structure		

a. 2,4-dibromo-1-(2,4-dibromophenoxy)benzene (BDE-47)1, 3, 5-Tribromo-2-(2, 4-dibromophenoxy) (BDE-100)benzene is classified as a Food Contaminant and Their environmental persistence has led to continuous human exposure and significant tissue levels. According to the structure, these two BDEs is more likely to present hydrophilic, thus they may enter the body by ingestion or inhalation and stay in the body for years.

10.

Trichloroethene



Average oxidation state of carbon is + 1

Average oxidation state of carbon is $-\frac{18}{17}$ and oxidation state of nitrogen is -3