

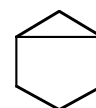
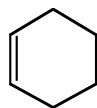
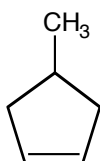
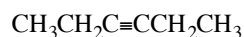
## INDEX OF HYDROGEN DEFICIENCY (IHD)

IHD - The number of H atom pairs that must be removed from an alkane of molecular formula  $C_nH_{2n+2}$  to give the molecular formula of the compound of interest. If a triple bond is considered as two double bonds, the IHD gives the number of rings and double bonds in a molecule.

Example:  $C_6H_{10}$

$C_nH_{2n+2}$  for  $n = 6$  is  $C_6H_{14}$  so  $IHD = (14-10)/2 = 2$

Some possible structures for a compound of this molecular formula are:



etc.

### NOTE

1. The presence of an O or S makes no difference in the index.
2. Halogens are regarded as the equivalent of a hydrogen.
3. Each N raises the number of hydrogens in the corresponding saturated parent compound by one.
4. No hydrocarbon can have an odd number of hydrogens

### EXAMPLES

Structure	Formula	Parent Formula	IHD	H-Deficient Structure
	$C_6H_6O$	$C_6H_{14}$	4	3 C=C, 1 ring
	$C_3H_5NO_2$	$C_3H_9NO_2$	2	1 N=O, 1 ring
$Cl_2CHCH_2C\equiv CH$	$C_4H_4Cl_2$	$C_4H_8Cl_2$	2	2 from $C\equiv C$
	$C_7H_{10}$	$C_7H_{16}$	3	1 C=C, 2 rings
	$C_9H_7N$	$C_9H_{21}N$	7	4 C=C, 1 C=N 2 rings