

Degrees of Unsaturation

From a molecular formula, we can calculate how many rings and/or multiple bonds (equals the “degrees of unsaturation”) are contained in a given molecule.

1. Count the total number of carbon atoms. If nitrogen atoms are present, count each nitrogen atom as 1/2 of a carbon atom (sounds weird, but it works).
2. If oxygen or sulfur atoms are present, ignore them.
3. Count the total number of hydrogen and halogen atoms.

Then use:

$$\text{Degrees of Unsaturation} = \frac{(2 \times \text{carbon atoms} + 2) - (\text{hydrogens} + \text{halogens})}{2}$$