

# A guide to formulae in organic chemistry

## Molecular formula

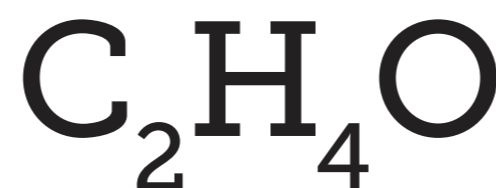
The molecular formula of an organic compound simply shows the number of each type of atom present. It tells you nothing about the bonding within the compound.



Molecular formula of butanoic acid

## Empirical formula

The empirical formula of an organic compound gives the simplest possible whole number ratio of the different types of atom within the compound.



Empirical formula of butanoic acid

## Condensed formula

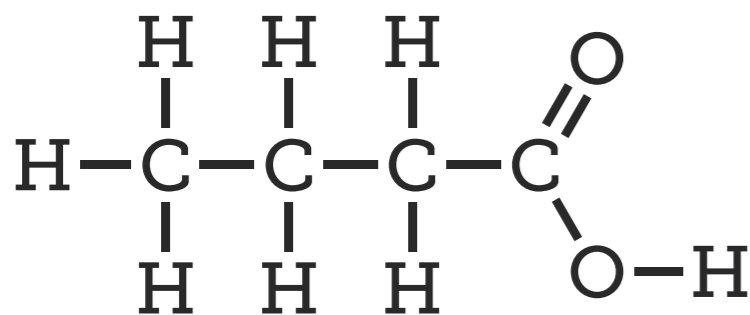
In condensed formulae, each carbon atom is listed separately, with atoms attached to it following. In cyclic parts of molecules, like benzene, carbons are grouped.



Condensed formula of butanoic acid

## Displayed formula

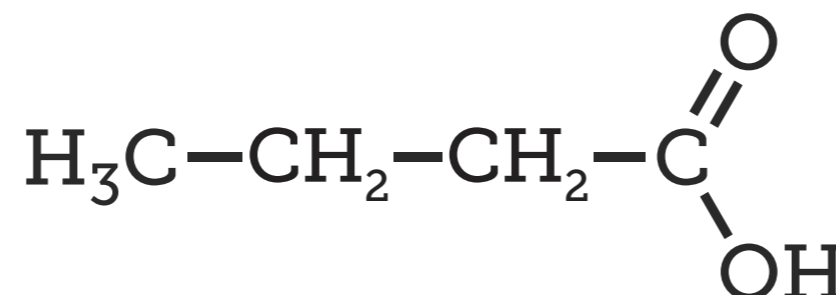
A displayed formula shows all of the atoms and all of the bonds present in an organic compound. The bonds are represented as lines.



Displayed formula of butanoic acid

## Structural formula

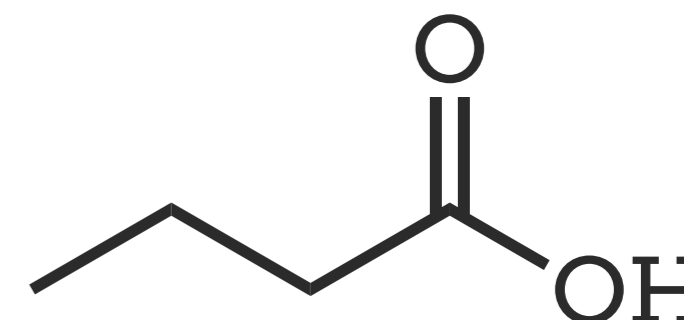
Similar to displayed formula; not all bonds are shown, although all atoms are still indicated using subscript numbers. Carbon hydrogen bonds are often simplified.



Structural formula of butanoic acid

## Skeletal formula

In skeletal formulae, most hydrogen atoms are omitted. Line ends or vertices represent carbons. Functional groups and atoms other than carbon or hydrogen are still shown.



Skeletal formula of butanoic acid