Isomer Classification

Comparing two molecules

Do they have the same formula? 

**NO**
non-isomeric compounds

**YES**
ISOMERS

Do they have the same connectivity?

**NO**

**CONSTITUTIONAL ISOMERS** (structural isomers)

e.g.  

\[
\begin{align*}
\text{Br} & \quad & \text{Br} \\
\text{O} & \quad & \text{OH}
\end{align*}
\]

**STEROISOMERS**
Isomers that have the same connectivity but differ in their spatial arrangement of atoms.

Can the structures be interconverted by rotation around \(\sigma\)-bonds?

**NO**

**CONFIGURATIONAL ISOMERS**

Are they non-superimposable mirror images of each other?

**NO**

**DIASTEREOMERS**
Stereoisomers that are non-superimposable, non-mirror images of each other.

more than 1 stereocenter  
cyclic cmpds  
alkenes

**YES**

**ENANTIOMERS**
Stereoisomers that are non-superimposable mirror images of each other.

**CONFORMATIONAL ISOMERS**
Stereoisomers that are superimposable by sigma bond rotation(s).

KC Russell, NKU, 2013