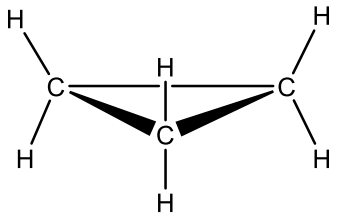
What is angle strain?

Angle strain, also known as bond angle strain or torsional strain, is a measure of the strain on a molecule due to deviations from the ideal bond angles. In a molecule, bond angles are the angles formed by two chemical bonds that are bonded to a common atom. The ideal bond angles for a given atom are determined by the hybridization of the atom and the number of bonds that it forms.

For example, in a molecule with a single bond, the ideal bond angle is 109.5 degrees. If the bond angle deviates significantly from this ideal value, it can result in angle strain, which can destabilize the molecule and decrease its stability.



The bond angle in cyclopropane is 60 degrees, not 109.5 degrees.

Angle strain can occur when the groups bonded to an atom are too large or bulky, causing the bond angles to be distorted. It can also occur when the molecule adopts an abnormal shape, such as a chair conformation in a cyclohexane ring. Angle strain can have a significant impact on the reactivity and stability of a molecule and is often considered in the design of chemical compounds.