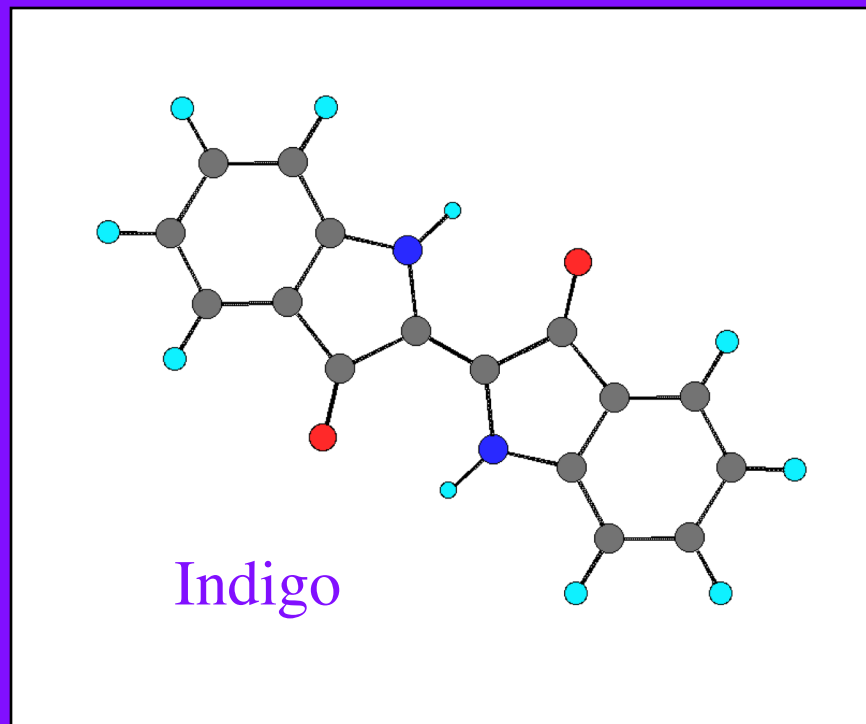


Wilhelm Adolph von Baeyer
(1835-1917)
Nobel Prize -1905



But, When It Came to Cycloalkanes,
Baeyer Got It Wrong

Historical Background

1858 - Kekule and Couper -Tetravalence of Carbon

1874 - van't Hoff and LeBel - Tetrahedral Carbon

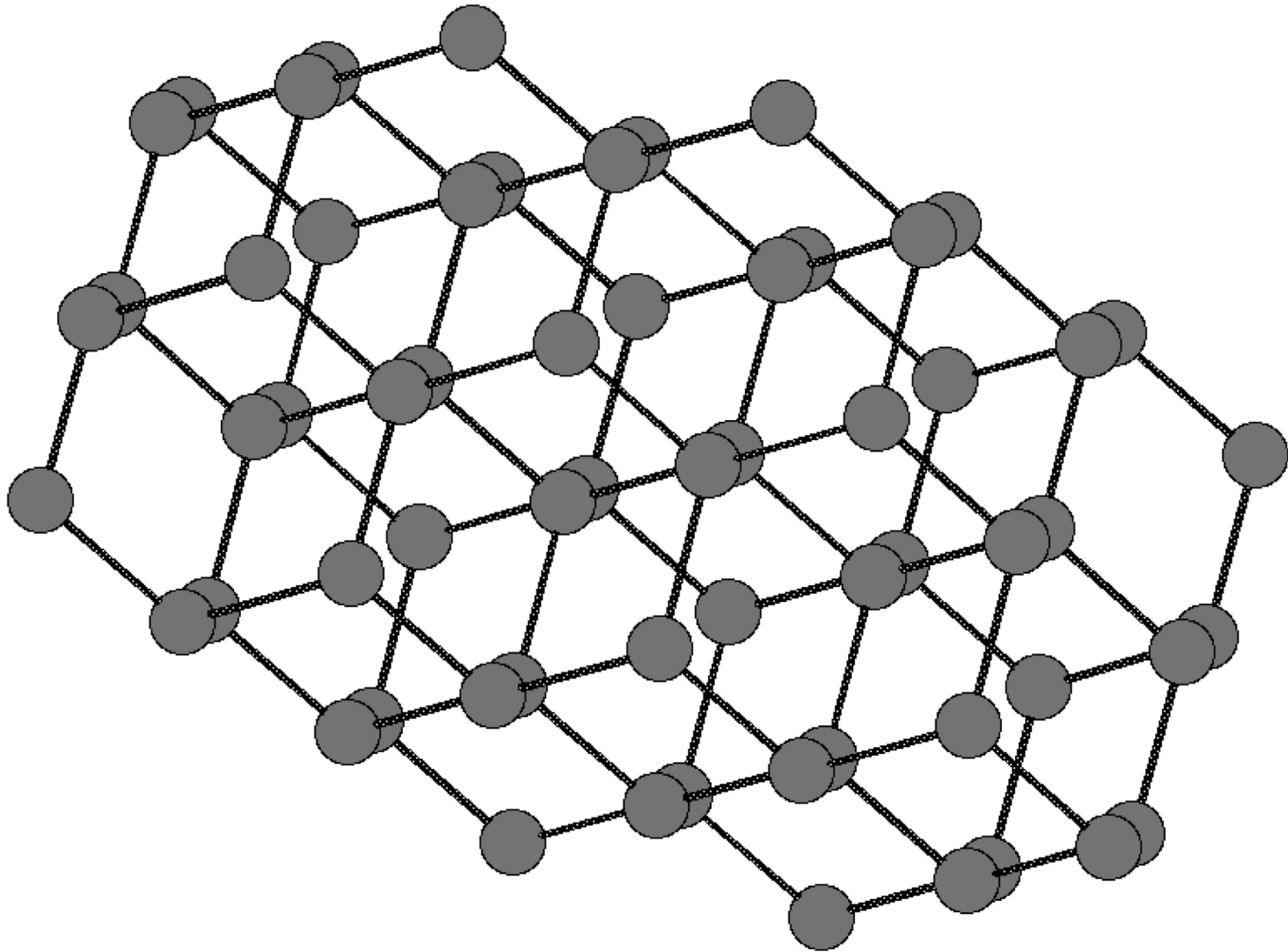
1885- Baeyer - Planar Cycloalkanes

- Polymethylene compounds (cycloalkanes) are strained.
- Since only one cyclohexane carboxylic acid is known, they must be planar.
- Cyclopentane is the least strained of the cycloalkanes.

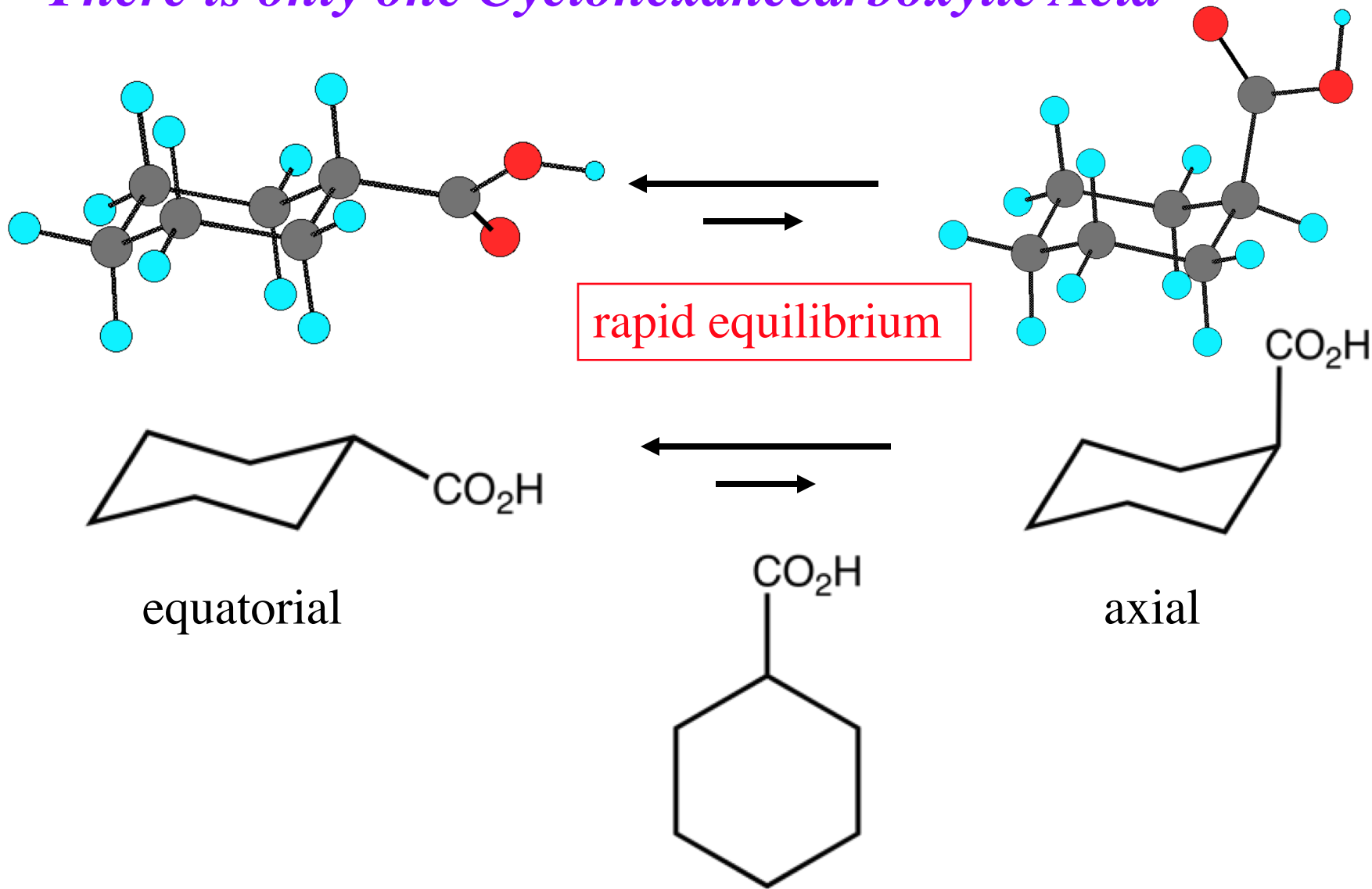
1890 - Sachse - Strain need not exist in larger rings.

1918 - Mohr - x-ray analysis of diamond

Diamond Lattice



“There is only one Cyclohexanecarboxylic Acid”




Baeyer's Analysis (1885)


•The sum of the supplementary angles of any polygon is 360° .


•The interior angle of a regular polygon = $180^\circ - (360/n)$.

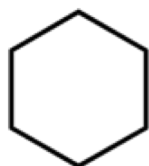
least strained
→

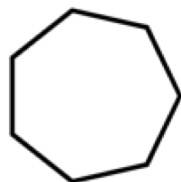
== $(109.5^\circ - 0^\circ)/2 = 54.75$

 $(109.5^\circ - 60^\circ)/2 = 24.75$

 $(109.5^\circ - 90^\circ)/2 = 9.75$

 $(109.5^\circ - 108^\circ)/2 = 0.75$

 $(109.5^\circ - 120^\circ)/2 = -5.25$

 $(109.5^\circ - 128.6^\circ)/2 = -9.55$