Steric strain is the increase in potential energy of a molecule due to repulsion between electrons in atoms that are not directly bonded to each other.

eg: Consider two staggered conformations of 1,2-dibromoethane:

In 1, the bromine atoms are closer to each other than they are in 2. (in 1, the dihedral angle between the bromine atoms is 60°; in 2, it is 180°.) Thus, the repulsion between electrons in one bromine atom and those in the other is greater in 1 than in 2. Thus, steric strain is greater in 1 than in 2. (Since the bromine atoms are pointing in opposite directions in 2, there is no steric strain in 2 due to interaction between the bromine atoms.)

see also torsional strain, angle strain, steric hindrance

Contributors

- Gamini Gunawardena from the OChemPal site (Utah Valley University)