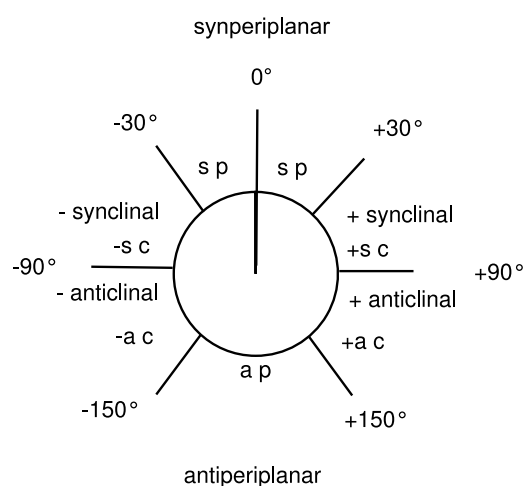


torsion angle

Also contains definitions of: anticlinal, antiperiplanar, clinal, periplanar, synclinal, synperiplanar

In a chain of atoms A-B-C-D, the dihedral angle between the plane containing the atoms A,B,C and that containing B,C,D. In a Newman projection the torsion angle is the angle (having an absolute value between 0° and 180°) between bonds to two specified (fiducial) groups, one from the atom nearer (proximal) to the observer and the other from the further (distal) atom. The torsion angle between groups A and D is then considered to be positive if the bond A-B is rotated in a clockwise direction through less than 180° in order that it may eclipse the bond C-D: a negative torsion angle requires rotation in the opposite sense. Stereochemical arrangements corresponding to torsion angles between 0° and $\pm 90^\circ$ are called syn (*s*), those corresponding to torsion angles between $\pm 90^\circ$ and 180° anti (*a*). Similarly, arrangements corresponding to torsion angles between 30° and 150° or between -30° and -150° are called clinal (*c*) and those between 0° and 30° or 150° and 180° are called periplanar (*p*). The two types of terms can be combined so as to define four ranges of torsion angle; 0° to 30° synperiplanar (*sp*); 30° to 90° and -30° to -90° synclinal (*sc*); 90° to 150° , and -90° to -150° anticlinal (*ac*); $\pm 150^\circ$ to 180° antiperiplanar (*ap*).



The synperiplanar conformation is also known as the syn- or cis-conformation; antiperiplanar as anti or trans and synclinal as gauche or skew. For macromolecular usage the symbols T, C, G^+ , G^- , A^+ and A^- are recommended (*ap*, *sp*, *+sc*, *-sc*, *+ac* and *-ac* respectively).

Source:

PAC, 1996, 68, 2193 (*Basic terminology of stereochemistry (IUPAC Recommendations 1996)*) on page 2220