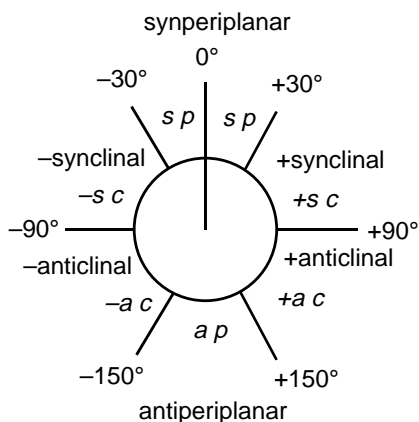


torsion angle

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).

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