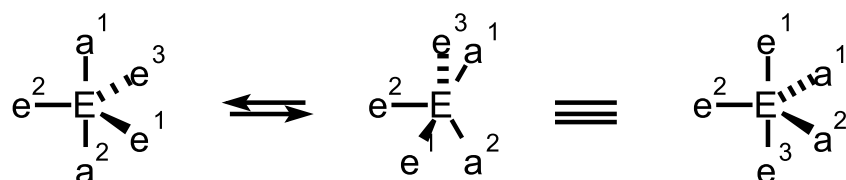


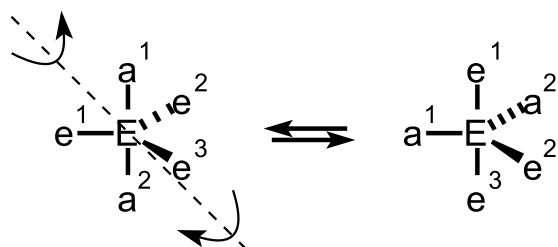
## pseudorotation

**Also contains definitions of:** Berry pseudorotation, turnstile rotation

Stereoisomerization resulting in a structure that appears to have been produced by rotation of the entire initial molecule and is superposable on the initial one, unless different positions are distinguished by substitution, including isotopic substitution. One example of pseudorotation is a facile interconversion between the many envelope and twist conformers of a cyclopentane due to the out of plane motion of carbon atoms. Another example of pseudorotation (Berry pseudorotation) is a polytopal rearrangement that provides an intramolecular mechanism for the isomerization of trigonal bipyramidal compounds (e.g.  $\lambda^5$ -phosphanes), the five bonds to the central atom E being represented as  $e^1$ ,  $e^2$ ,  $e^3$ ,  $a^1$  and  $a^2$ . Two equatorial bonds move apart and become apical bonds at the same time as the apical bonds move together to become equatorial.



A related conformational change of a trigonal bipyramidal structure is described as turnstile rotation. The process may be visualized as follows.



An apical and an equatorial bond rotate as a pair ca.  $120^\circ$  relative to the other three bonds. (Doubts have been expressed about the distinct physical reality of this mechanism.)

### Source:

PAC, 1996, 68, 2193 (*Basic terminology of stereochemistry (IUPAC Recommendations 1996)*) on page 2215