

Achievements and trends in developments of Stereochemistry

Oleg Kolodiazhnyi, Anastasy Kolodiazhna, Olga Kolodiazhna, Alena Slastennikova,
Evgen Grishkun, Dmitry Prysiashnuk, Sergei Sheiko

Kukhar Institute of Bioorganic Chemistry and Petrochemistry, NAS of Ukraine, Kiev
e-mail: oikol123@bpci.kiev.ua

Stereochemistry is of great scientific and practical importance, being an important area of research in the development of technologies for the production of biologically active compounds, pharmaceuticals and agrochemicals. The nature of homochirality and abiogenesis is one of the most important unsolved problems of modern science. Symmetry and asymmetry of chemical molecules are closely related to the chiral symmetry of elementary particles and physical fields [1,2]. Without taking into account chirality, it is impossible to study the most important scientific problem of the millennium - the chemical picture of the origin of life, the nature of the homochirality of amino acids, carbohydrates and other natural compounds. The stereochemistry of nucleophilic and electrophilic biological reactions proceeding via the dissociative cleavage-attachment mechanism with the formation of an intermediate metaphosphate anion, or through the associative attach-cleavage mechanism with the formation of an intermediate phosphorane, is very important. theoretical point of view [3]. The processes of asymmetric mechanochemistry and kinetic separation reactions in a heterogeneous medium with the participation of nanoparticles attract the attention of chemists. The sequential enzyme binding model describes the cooperativity of protein subunits. In particular, Koshland's MWC model postulates that the conformation of the active site of the enzyme changes with each binding of the ligand, thus sequentially changing its affinity for the ligand in a "hand-and-glove" manner, of undoubted interest in the study of the mechanisms of kinetic separation of racemates [2]

This report discusses the progress achieved in the study of stereochemical processes by chemists of the Institute of Bioorganic Chemistry and Petrochemistry of the National Academy of Sciences, as well as future trends in the further development of this important field of chemistry.

References

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