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Stability Under Irradiation of Some Aminoacids

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Homochirality of certain organic molecules essential for all living organisms, such as the L-amino acids and the D-sugars, has made the search for its origin an important issue in studies of the origin of life and evolution. Comets and asteroids are thought to include organic compounds imbibed in ices, rocks, and have been proposed as carrier of those compounds to the early Earth. Among the products detected in meteorites (carbonaceus condrites)are amino acids, which are key compounds for chemical evolution studies. The meteoritic amino acids are of the D and L optical isomers types with a lightly enantiomeric excess. The mechanism involved for this excess is still a debate. One theory involves the irradiation with high energy on racemic mixtures.

The purpose of this work is to study the stability under irradiation of some amino acids (in solid state and in aqueous solutions). For this purpose, individual amino acids (L, D and D,L alanine, L, D and D,L serine and L, D and D,L phenylalanine) were exposed to different irradiation doses up to 90 MGy that is a dose higher than the calculated total dose that received a comet since it formation.

The analysis of the samples was made by high performance liquid chromatography with a quiral column. The results show that the molecules under study presented great stability under gamma irradiation and the recovery is more than 60%.

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