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Evalution of Enantiomeric Decomposition of Amino Acids by Circularly Polalized UV and beta-rays

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In order to examine the possible generation of enantio excesses in space environments, amino acid solution was irradiated with circularly polarized UV light (CPL-UV) or beta-rays (left-hand polarized electrons). Aquesous solution of isovaline (IVal), histidine (His), or copper complex of His (pH = 3, 7 or 11 in all cases) was irradiated with CPL-UV from a free-electron laser of UV-SOR (IMS, Japan). Aqueous solution of copper complex of His, copper complex of IVal, or Val was irradiated with beta-rays from ^{90}Sr-^{90}Y source (50 Ci) equipped in Snezhinsk, Russia. DL-Amino acids were determined by HPLC.
Enantiomeric excesses were observed after CPL-UV irradiation to some of basic amino acid solutions. It was suggested that pH of the irradiated solution is an important parameter of chirogenesis by CPL-UV. Circular dichroism (CD) was observed after CPL-UV irradiation of amino acid thin films.
Enantimeric excesses were observed in beta-irradiated amino acid solutions. Gusev et al. also reported that CD was observed afte beta-irradiation of amino acid solutions. These results suggested that high flax beta-rays triggered by supernova explosion might caused the asymmetry in amino acids.
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Keywords: homochirality, amino acids, origins of life, circularly polarized light, beta-rays, assymmetry