

A process model of L-homochiral peptides formation initiated with L-alanine

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Hydrogen abstraction from L-alanine by hydroxy radical facilitates alkylation on β -carbon of alanine as well as retention of L-chirality. The reaction rate constant of hydrogen abstraction ($k=6.21 \times 10^7 \text{ M}^{-1} \text{ s}^{-1}$) on β -carbon was about 3.7 times faster than that ($k=1.7 \times 10^7 \text{ M}^{-1} \text{ s}^{-1}$) on α -carbon. The fact supports that alkylation proceeds faster than racemization, and the chirality of product amino acids will be hold. Similar alkylation of oligopeptides will also proceed with a lower level epimerization than alkylation. This research discusses how the lower reaction rate of epimerization than alkylation lead homochiral peptides.

Keywords: L-alanine, peptides, homochirality