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# Optically Selective Adsorption of $\alpha$ -Amino Acids on Montmorillonite-Cu-l-Lysine Complexes in High-Pressure Liquid Chromatography

Faina Tsvetkov and U. Mingelgrin

Institute of Soils and Water, Agricultural Research Organization, P.O. Box 6 The Volcani Center, Bet Dagan 50-250, Israel

**Abstract:** Optically active cationic complexes adsorbed on montmorillonite can be used for the resolution of racemic mixtures. Montmorillonite-Cu-lysine systems were used as a solid phase in high-pressure liquid chromatography for the resolution of the optical isomers of  $\alpha$ -amino acids. Selectivity constants  $> 1.5$  were measured for phenylalanine and tryptophan. The selectivity constants for the amino acids containing saturated-hydrocarbon side chains were in the range of 1.25– 1.44. The montmorillonite-Cu-l-lysine complex displayed a stronger affinity for the l-isomers of  $\alpha$ -amino acids than for the d-isomers at pHs near neutrality. Inasmuch as surface-catalyzed peptide formation on clays has been proposed as a step in chemical evolution, this stronger affinity between the clay-Cu-l-amino acid complex and l-amino acids might have been significant in prebiotic evolution. The mechanism of optical resolution probably involved ligand exchange. Optimizing the choice of the optically active ligands and of the chelating cation in the chiral agent may improve the resolution of the optical isomers.

**Key Words:** Adsorption • Amino acid • Cu-l-lysine • High-pressure liquid chromatography • Montmorillonite • Optically active ligands

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