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Selective transport of neutral amino acids across a double-membrane system comprising cation and anion exchange membranes

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Abstract

A double-membrane system comprising a cation-exchange membrane and an anion-exchange membrane can separate acidic, basic, and neutral amino acids in a dialysis process without changing the solution pH. Amino acids with similar electrical charges, neutral amino acids, were also separated in this system according to their molecular weights and hydrophilic/hydrophobic properties in a neutral pH range. The transport of neutral amino acids was enhanced across the H^+ type cation-exchange membrane and the OH^- type anion-exchange membrane, and the transport properties in this system were investigated. The transport equation in this system for amino acids was derived using the constants of the membrane properties. Neutral amino acids are separable efficiently by the combination of cation and anion exchange membranes.

Graphical abstract

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