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(54) **METHOD FOR PRODUCING L-CARNITINE FROM CROTONOBETAINE USING A TWO STAGE CONTINUOUS CELL-RECYCLE REACTOR**

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(58) **Field of Search** 435/128, 174, 435/176, 180, 136, 280, 252.8, 849

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(57) **ABSTRACT**

L(−)-carnitine is synthesized from crotonobetaine, crotonobetaine salts or derivatives in an ecologically advantageous manner by immobilizing cells of *Escherichia coli* 044 K74 on ceramics, glass beads or polyurethane disks in a two stage continuously operating cell recycle reactor containing a reaction medium. The medium preferably contains between 25 mM and 1 M crotonobetaine and at least 50 mM fumarate. Growing or resting cells of *E. coli* are retained in the reactor by micro or ultrafiltration membranes which are arranged as a flat membrane module or hollow fiber module. A first stage contains a reactor tank and a second stage contains an external recirculation loop connected to the tank for feeding the reaction medium through a filter unit. L-carnitine is synthesized under anaerobic conditions to produce a reaction medium containing L-carnitine and unreacted crotonobetaine. The reaction medium is transferred through the recirculation loop to the filter unit to produce a filtrate containing L-carnitine and a residue containing unreacted crotonobetaine and cells. The residue is recirculated to the reactor tank.

9 Claims, No Drawings