BIOPRODUCTION OF (R)-MANDELIC ACID FROM STYRENE, L-PHENYLALANINE, GLUCOSE, OR GLYCEROL VIA NOVEL ARTIFICIAL BIOSYNTHETIC PATHWAY

ABSTRACT

The present invention relates to a method for producing an enantiomerically pure or enantiomerically enriched (R)- mandelic acid or a derivative thereof using one or more recombinant microbial cells genetically engineered to overexpress multiple enzymes, which method comprises subjecting styrene or a derivative thereof to multiple enzyme-catalyzed chemical transformations in a one-pot reaction system, optionally wherein at least one overexpressed enzyme is located on one or more plasmids or integrated in the chromosome of each of the one or more recombinant microbial cells. In a specific embodiment, the one or more recombinant microbial cells are genetically engineered to overexpress multiple enzymes, including epoxidase, epoxide hydrolase, oxygenase, oxidation enzyme, ammonia lyase, and a decarboxylase.

FIG. 1b-c