A common feature of all of the described methods is that the yields and conversion rates are low. Moreover, in the described methods, a high expenditure for the provision of the biocatalyst is always required, which then only has a short service life, i.e. which can then only be used in the short-term.

It was therefore an object of the embodiments disclosed herein~~invention~~ to provide a method which overcomes the described disadvantages of the prior art.

Summary

In one aspect, there is provided a method for producing aldehydes, comprising the steps

A) bringing a vicinal diol into contact with a hydro-lyase, wherein the vicinal diol is glycerol or 1,2-propanediol and the hydro-lyase is selected from glycerol dehydratase, diol-dehydratases and propanediol dehydratases,

B) separating the aldehyde formed in step A) and the hydro-lyase,

C) at least one repetition of steps A) and B) with the hydro-lyase obtained from step B) and optionally

D) isolating the aldehyde formed,

characterized in that

the method is carried out in the presence of a compound which forms a bond with the aldehyde, said compound being selected from hydrazides, hydrazines, hydrogensulfites, sulfites, metabisulfites and pyrosulfites.

In another aspect, there is provided a method for producing oxidation or reduction products of an aldehyde, comprising the steps:

I) provision of an aldehyde by a method as defined above,

II) chemical or biocatalytic reaction of the aldehyde by reduction, oxidation, disproportionation or dehydration to give optionally unsaturated reduction or oxidation intermediates and optionally

III) the further chemical or biocatalytic reaction of the reduction or oxidation intermediates obtained in step II) by reduction, oxidation, or addition.

Description of the invention

Surprisingly, it has been found that the methods described below are able to achieve the object of the invention.

The present invention therefore provides a method for producing aldehydes, comprising the steps A) bringing preferably an aqueous solution of a vicinal diol into contact with a hydro-lyase, B) separating the aldehyde formed in step A) and the hydro-lyase, C) at least one repetition of steps A) and B) with the hydro-lyase obtained from step B) and optionally D) isolating the aldehyde formed, characterized in that the method is carried out in the presence of a compound which forms a bond with the aldehyde.

The invention further provides a method for producing oxidation and reduction products of the aldehyde obtained by the aforementioned method.

Advantages of the method according to the invention are the virtually quantitative yield of aldehyde based on the alcohol used, the long service life of the hydro-lyase used as