Strategy for biological co-production of levulinic acid and polyhydroxyalkanoates by using mixed microbial cultures fed with synthetic hemicellulose hydrolysate

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Hemicellulose hydrolysates (HH), which could be an interesting carbon source to feed mixed microbial cultures (MMC) able to accumulate high value-added compounds. This research focused on the evaluation of a culture strategy to achieve the simultaneous biological production of Levulinic Acid (LA) and Polyhydroxyalcanoates (PHA) by MMC fed with a synthetic HH (SHH). The culture strategy involves the use of sequential batch reactors (SBR) to select microorganisms capable of producing LA and PHA. This work proved that the cultivation strategy used allowed the biological production of LA, reaching 37%w/w when the SHH was composed of 85% pentoses. In addition, the simultaneous biological production of LA and PHB was possible when the SHH was enriched with acetate (45% pentoses? 50% acetate). Finally, this study showed that the composition of the SHH impacts directly on the selected microorganism genus and the type and quantity of the value-added compounds obtained. © 2020 Elsevier Ltd

Hemicellulose hydrolysate

Levulinic acid biological production

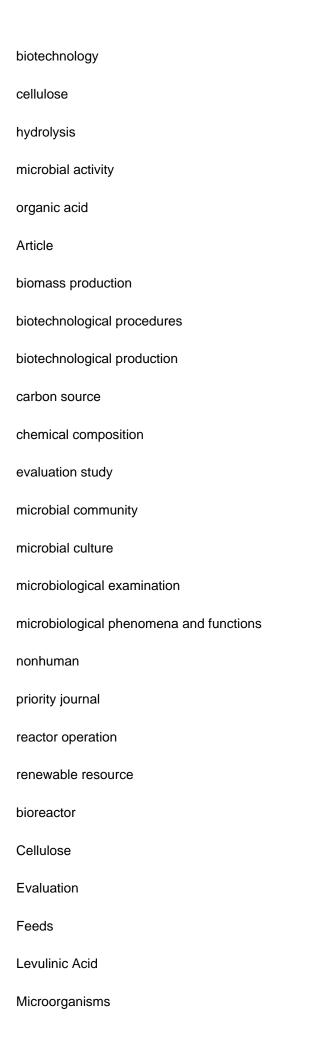
Mixed microbial cultures

Polyhydroxyalkanoates and levulinic acid co-production

Batch reactors

Microorganisms

| Organic acids |
|----------------------------|
| Biological co |
| Biological production |
| Carbon source |
| Hemicellulose hydrolysates |
| Levulinic acid |
| Mixed microbial culture |
| Polyhydroxyalkanoates |
| Sequential batch reactors |
| Cellulose |
| acetic acid |
| carbohydrate derivative |
| dissolved oxygen |
| hemicellulose |
| hemicellulose hydrolysate |
| levulinic acid |
| pentose |
| polyhydroxyalcanoate |
| polyhydroxyalkanoic acid |
| polymer |
| unclassified drug |
| levulinic acid |
| polysaccharide |
| acetate |
| biological production |
| bioreactor |
| |



| Production |
|-----------------------|
| Bioreactors |
| Levulinic Acids |
| Polyhydroxyalkanoates |
| Polysaccharides |
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Organic Acids

Pentoses