PROCESS FOR THE PRODUCTION OF SUGARS FROM BIOMASS

The present invention relates to a process for the production of sugars from biomass including at least one polysaccharide.

More specifically, the present invention relates to a process for the production of sugars from biomass including at least one polysaccharide which comprises putting a biomass in contact with an aqueous solution of at least one organic acid having from 1 to 6 carbon atoms, preferably from 1 to 3 carbon atoms, the pH of said aqueous solution being ranging from 0.6 to 1.6, preferably ranging from 0.9 to 1.3.

The present invention also relates to a process for the production of sugar(s) from at least one biomass including at least one polysaccharide which comprises putting a biomass in contact with an aqueous solution of at least one organic acid, said organic acid being selected from alkyl-sulfonic acids having general formula (I):

$$R\text{-}SO_3H$$

wherein R represents a linear of branched C_1-C_6 alkyl group; the pH of said aqueous solution being ranging from 0.6 to 1.6, preferably ranging from 0.9 to 1.3.

The sugars thus obtained can be advantageously used as carbon sources in fermentation processes for the production of alcohols (e.g., ethanol, butanol), diols (e.g., 1,3-propanediol, 1,3-butanediol, 1,4-butanediol,

2,3-butanediol), lipids, or other intermediates or products. Said alcohols, diols, lipids, or other intermediates or products, can be advantageously used in the chemical industry or in the formulation of fuels for motor vehicles. Said alcohols and said diols can also be advantageously used in the bio-butadiene production.

The production of sugars from biomass, in particular lignocellulosic biomass, is known in the art.

CLAIMS

1. A process for the production of sugar(s) from at least one biomass including at least one polysaccharide which comprises putting a biomass in contact with an aqueous solution of at least one organic acid, said organic acid being selected from alkyl-sulfonic acids having general formula (I):

$$R\text{-}SO_3H$$

wherein R represents a linear or branched C_1-C_6 alkyl group; the pH of said aqueous solution being ranging from 0.6 to 1.6, preferably ranging from 0.9 to 1.3.

2. The process according to claim 1, wherein said polysaccharide is selected from cellulose, hemicellulose, or mixtures thereof, preferably from hemicellulose, or mixtures of hemicellulose and cellulose.

3. The process according to claim 1 or 2, wherein said biomass is a lignocellulosic biomass, preferably selected from:

- products of crops expressly cultivated for energy use (for example, miscanthus, foxtail millet, common cane), including waste products, residues and scraps of said crops or of their processing;
- products of agricultural cultivations, forestation and silviculture, comprising wood, plants, residues and waste products of agricultural processing, of forestation and of silviculture;
- waste of agro-food products destined for human nutrition or zootechnics;

- residues, not chemically treated, of the paper industry;
- waste products coming from the differentiated collection of solid urban waste (e.g., urban waste of a vegetable origin, paper).

4. The process according to claim 1 or 2, wherein said lignocellulosic biomass is selected from: guayule (Parthenium argentatum), thistle (Cynara cardunculus L.), conifers (pines, fir trees)

5. The process according to any of the previous claims, wherein said biomass is subjected to a preliminary grinding process before being put in contact with said aqueous solution of at least one organic acid.

6. The process according to any of the previous claims, wherein R represents a linear or branched C_1-C_3 alkyl group.

7. The process according to claim 6, wherein said at least one organic acid is methane-sulfonic acid (CH_3-SO_3H).

8. The process according to any of the previous claims, wherein said process for the production of sugars from biomass comprises:

- putting a biomass in contact with an aqueous