

Abstract

A process for preparing alkanols (I) selected from the group consisting of isopropanol and 2-butanol from the corresponding alkanes (II) selected from the group consisting of propane and n-butane, comprising the steps of:

- A) providing a starting gas stream a comprising the alkane (II);
- 10 B) feeding the starting gas stream a comprising the alkane (II) into a dehydrogenation zone and subjecting the alkane (II) to a dehydrogenation to the alkene (III) to obtain a product gas stream b comprising the alkene (III) and unconverted alkane (II), with or without high boilers, steam, hydrogen and low boilers;
- 15 C) at least compressing product gas stream b, optionally separating product gas stream b into an aqueous phase c1, a phase c2 comprising the alkene (III) and the alkane (II), with or without high boilers, and a gas phase c3 comprising hydrogen and low boilers;
- 20 D) reacting product gas stream b or the phase c2 comprising alkene (III) and alkane (II) with an organic acid (IV) in an esterification zone to obtain a product mixture d comprising the corresponding alkyl ester (V) of the organic acid and the unconverted alkane (II);
- 25 E) removing from product mixture d a gas stream e1 which comprises an alkane (II) and is recycled into the dehydrogenation zone if appropriate, and a product mixture e2 comprising the alkyl ester;
- 30 F) reacting the product mixture e2 comprising the alkyl ester with water in an ester hydrolysis zone to give a product mixture f comprising the alkanol (I) and the organic acid (IV);
- 35 G) removing the alkanol (I) and the organic acid (IV) from product mixture f and, if appropriate, recycling the organic acid into the esterification zone.

(Figure 1)