

simple way by dehydration of 3-methyl-1-butanol when a mesoporous aluminium oxide having a uniform pore structure is used as catalyst.

Summary

In one aspect, ~~the present disclosure~~~~invention~~ ~~accordingly~~ provides a process for preparing 3-methyl-1-butene by dehydration of 3-methyl-1-butanol over an aluminium-containing oxide in the temperature range from 200 to 450°C in the gas phase or mixed liquid/gas phase, characterized in that an aluminium-containing oxide having a predominantly mesoporous pore structure whose:

- a) relative proportion of macropores is less than 15%;
- b) distribution of the pore diameter has a monomodal maximum in the range of mesopores from 3.6 to 50 nm;
- c) average pore diameter of all pores is in the range of mesopores and macropores from 5 to 20 nm;
- d) composition comprises more than 80% of gamma-aluminium oxide, is used.

The present ~~disclosure~~~~invention~~ likewise provides a mixture containing 3-methyl-1-butene and 2-methyl-1-butene and/or 3-methyl-2-butene in which the proportion by mass of 3-methyl-1-butene is at least 90% by mass and the proportion by mass of 2-methyl-1-butene and/or 3-methyl-2-butene is less than 10% by mass.

The process of the ~~present disclosure~~~~invention~~ has the following advantages:

- a) inexpensive, commercially available aluminium oxides which are frequently already present in the desired form can be used
- b) without after-treatment.

This results in a cost advantage. Furthermore, the catalysts used according to the ~~present disclosure~~~~invention~~ have a high activity and product selectivity.

Description

In the process of the invention for the dehydration of 3-methylbutanol to 3-methyl-1-butene, specific γ -aluminium oxides are used. Preference is given to using mesoporous aluminium oxides having a uniform pore structure. The γ -aluminium oxides used according to the invention have the following features:

the relative proportion of the pore volume made up by macropores (pore diameter from 50 nm to 100 μm) in the pore diameter range from 3.6 nm to 100 μm , determined by Hg porosimetry, is less than 15%. (The relative pore volume of macropores is the ratio of the pore volume over the total macropore range to the total pore volume). In particular, this ratio is less than 10%, very particularly preferably less than 5%.