

Abstract

A process for isolating isobutene from a hydrocarbon mixture by

- a) combining the C₄-hydrocarbon mixture with a primary C₃- or C₄-alkanol;
- b) reacting the isobutene in the C₄-hydrocarbon mixture with the primary C₃- or C₄-alkanol in the presence of a heterogeneous catalyst to give the corresponding tertiary ether of isobutene,
- c) separating the resultant reaction mixture into the relatively low-boiling, unetherified C₄-hydrocarbons and the relatively higher-boiling tertiary ether of isobutene with the aid of a distillation column, where the C₄-hydrocarbons are taken off at the top, and the tertiary ether of isobutene obtained at the bottom is transferred into a reactor,
- d) cleaving this ether into isobutene and the corresponding primary C₃- or C₄-alkanol,
- e) distilling this mixture from d) in a further distillation column, and taking off the isobutene as the top product,

which comprises carrying out step a) in a zone (4C) containing reactive internals and containing the catalyst for carrying out step b) arranged in such a way that the zone (4C) is integrated into a distillation column (4), that a reactive distillation takes place in this zone (4C), and that the C₃- or C₄-alkanol is fed to the distillation column above the zone (4C) and the C₄-hydrocarbon mixture is fed to the distillation column below the zone (4C).