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(54) Title: PROCESS FOR OBTAINING ISOBUTENE FROM A C4-HYDROCARBON MIXTURE

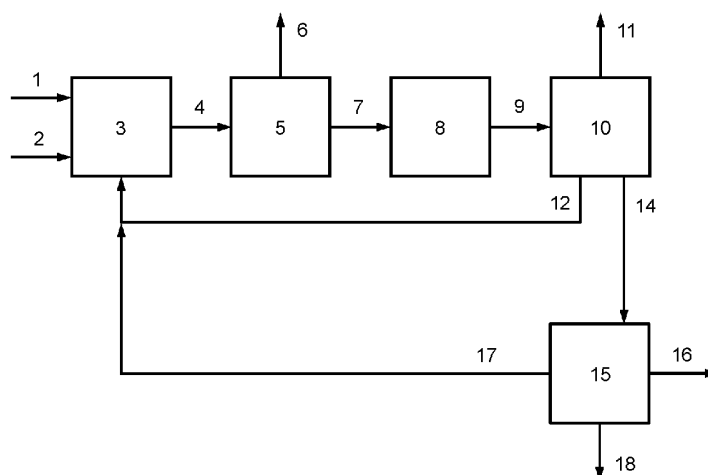


Fig. 1

(57) **Abstract:** The invention relates to a process for obtaining isobutene from an isobutene containing C4-hydrocarbon mixture (1) in a plant comprising an etherification unit (3), a first distillation unit (5), an ether cleavage unit (8) and a second distillation unit (10), the process comprising: (a) contacting the C4-hydrocarbon mixture (1) with a primary alcohol (2) and reacting the mixture with the primary alcohol in the presence of an acidic catalyst to form the corresponding alkyl tert-butyl ether as an intermediate product and diisobutene as a by-product in the etherification unit (3); (b) distilling the reaction mixture (4) from the etherification unit (3) in the first distillation unit (5), a C4-hydrocarbon raffinate being withdrawn as the overhead product (6), the alkyl tert-butyl ether and diisobutene being withdrawn as the liquid or vaporous bottom product (7), and vaporizing the bottom product (7) if it is withdrawn as a liquid; (c) reacting the vaporous bottom product (7) in the presence of an acidic catalyst obtaining isobutene and the primary alcohol as reaction products in the ether cleavage unit (8); (d) distilling the reaction mixture (9) from the ether cleavage unit (8) in the second distillation

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unit (10), isobutene being withdrawn as the overhead product (11), the primary alcohol and diisobutene being withdrawn as the bottom product (12) and being recycled to the etherification unit (3); the plant further comprising a byproduct separation unit (15) being fed by a bottom purge stream (13) of the first distillation unit (5) and/or by a part of the bottom product of the second distillation unit (10), wherein a diisobutene product stream rich in diisobutene is separated from this feed stream (13, 14).