

SPECIFICATION

PROCESS FOR RECOVERING CUMENE

5 Technical Field

 The present invention relates to a process for recovering cumene. More particularly, the present invention relates to a process for recovering cumene, in which 2,3-dimethyl-2,3-diphenylbutane produced in a process in which cumene is used,
10 is efficiently recovered as cumene.

Background Art

 As a process using cumene as a raw material for reaction, there are known a process having steps of converting cumene
15 into cumene hydroperoxide and obtaining propylene oxide from such cumene hydroperoxide and propylene, a process of converting cumene into cumene hydroperoxide and obtaining phenol and acetone by subjecting such cumene hydroperoxide to acidolysis, and the like. In those processes, there is a reaction producing
20 2,3-dimethyl-2,3-diphenylbutane by dimerizing cumene as an undesirable side-reaction. By-production of 2,3-dimethyl-2,3-diphenylbutane causes undesirable effects such as consumption of cumene and obstruction to a desired reaction.

25 Disclosure of the Invention

An object of the present invention is to provide a process for recovering cumene, in which 2,3-dimethyl-2,3-diphenylbutane produced in a process in which cumene is used, is efficiently recovered as cumene.

5 Namely, the present invention relates to a process for recovering cumene, which comprises:

 subjecting 2,3-dimethyl-2,3-diphenylbutane produced in a process in which cumene is used, to hydrogenolysis in the presence of a catalyst thereby to it convert into cumene, and
10 recovering cumene.

Best Mode for Carrying out the Invention

 As a process using cumene, there can be listed a process having steps of converting cumene into cumene hydroperoxide and obtaining propylene oxide from such cumene hydroperoxide
15 and propylene, a process of converting cumene into cumene hydroperoxide and obtaining phenol and acetone by subjecting such cumene hydroperoxide to acidolysis, and the like.

 The recovering process of the present invention is to recover
20 cumene obtained by subjecting 2,3-dimethyl-2,3-diphenylbutane produced to hydrogenolysis in the presence of a catalyst thereby to convert it into cumene.

 As the catalyst, a catalyst containing a metal of Group 10 or 11 of the Periodic Table (IUPAC Inorganic chemistry
25 nomenclature, revised edition(1989)), is preferable. The metal

is preferably at least one selected from the group consisting of copper, palladium, platinum and nickel. It is preferable to use a copper-based catalyst from the viewpoint of suppressing of by-products. As the copper-based catalyst, there can be
5 listed copper, Raney copper, copper-chromium, copper-zinc, copper-chromium-zinc, copper-silica, copper-alumina, etc.

Hydrogenolysis can be carried out in a liquid phase or gas phase. A hydrogenolysis temperature is usually 0 to 500°C, and preferably 30 to 400°C. It is advantageous that a pressure
10 is usually 100 to 10000kPa. It is good that hydrogen exists equi-molar to 2,3-dimethyl-2,3-diphenylbutane or more.

Hydrogenolysis can be advantageously carried out using a catalyst having a shape suitable for a slurry or fixed bed.

The process of the present invention can be conducted in
15 batch, semi-continuous or continuous process.

When the process using cumene is a process having a step of obtaining propylene oxide from cumene hydroperoxide and propylene, it is preferable that hydrogenolysis is carried out after propylene oxide is separated and removed from the reaction
20 products. When it is required to recover cumene from cumyl alcohol, hydrogenolysis can be also subjected to a reaction liquid containing cumyl alcohol as it is because cumyl alcohol produced in the step of obtaining propylene oxide from cumene hydroperoxide and propylene, is converted into cumene by
25 hydrogenolysis, and when it is not desired to subject cumyl

alcohol to hydrolysis, hydrolysis can be carried out after separating and removing cumyl alcohol. Hydrolysis can be carried out after separating and removing cumyl alcohol. It is preferable to carry out hydrolysis after separating-removing or concentrating 2,3-dimethyl-2,3-diphenylbutane from a view point of suppressing side-reactions of effective ingredients such as cumene, cumyl alcohol and the like to a minimum.

When the process in which cumene is used, is a process for obtaining phenol and acetone by subjecting cumene hydroperoxide to acidolysis, it is preferable to carry out hydrolysis after separating and removing acetone and phenol to minimize losses caused to hydrogenation of acetone and nuclear-hydrogenation of phenol.

Cumene recovered can be used effectively in the same process or another process.

Example

Example 1

A solution containing 1 % by weight of 2,3-dimethyl-2,3-diphenylbutane was passed through a reactor filled with 16 cc of a copper-chromium catalyst (3 mm ϕ pellet) at a rate of 1 g/minute at a temperature of 220 to 260 °C under a pressure of 1 MPaG together with 300 cc/minute of hydrogen. Results were shown in Table 1.

Table 1

Reaction temperature	2,3-Dimethyl-2,3-diphenylbutane conversion *1	Cumene selectivity *2
220 °C	84 %	100 %
240 °C	97 %	100 %
260 °C	100 %	100 %

*1: 2,3-Dimethyl-2,3-diphenylbutane conversion = converted 2,3-dimethyl-2,3-diphenylbutane (mol) / fed 2,3-dimethyl-2,3-diphenylbutane (mol) x 100

5 *2: Cumene selectivity = 0.5 X produced cumene (mol) / converted 2,3-dimethyl-2,3-diphenylbutane (mol) X 100

Industrial Applicability

As described above, according to the present invention,
10 a process for recovering cumene, in which 2,3-dimethyl-2,3-diphenylbutane produced in a process in which cumene is used, is efficiently recovered as cumene, can be provided.

CLAIMS

1. A process for recovering cumene, which comprises:
subjecting 2,3-dimethyl-2,3-diphenylbutane produced
5 in a process in which cumene is used, to hydrogenolysis in the
presence of a catalyst thereby to convert it into cumene, and
recovering the cumene.
2. The process for recovering cumene according to claim
1, wherein the catalyst is a catalyst containing a metal of
10 Group 10 or 11 of the periodic table.
3. The process for recovering cumene according to claim
2, the metal is at least one selected from the group consisting
of copper, palladium, platinum and nickel.
4. The process for recovering cumene according to claim
15 1, wherein the process in which cumene is used, contains steps
of converting cumene into cumene hydroperoxide and obtaining
propylene oxide from the cumene hydroperoxide and propylene.