

UNITED STATES PATENT OFFICE

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PROCESS FOR THE PRODUCTION OF KETONES FROM SECONDARY ALCOHOLS

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It is known that secondary alcohols, such as isopropyl alcohol, menthol, borneol and others, may be converted into the corresponding ketones by leading them over dehydrogenating catalysts. This dehydrogenation, however, never proceeds to completion, because the hydrogen formed itself further hydrogenates the ketone, so that the reaction product still contains considerable quantities of alcohol which must be separated from the ketone by particular methods.

It has now been found, that a 97-100% dehydrogenation of the alcohols can be attained if they are led over the dehydrogenation catalysts in the presence of steam. The presence of the steam hinders the further hydrogenation of the already formed ketone and has at the same time the advantage, that the operation can be effected in the gaseous phase at temperatures which lie below the boiling point of the alcohols. In general temperatures of 120°-300° C. can be employed. As catalysts there can be employed metals such as nickel, cobalt, copper, preferably in a powdered form eventually admixed with hydrates or oxides of the alkali or alkaline earth metals.

Example 1.—From a distillation apparatus charged with menthol a menthol-steam mixture is passed by means of steam through a tube system filled with dehydrogenating catalysts and heated to about 185° C., the end of which is provided with an efficient condenser. The condensate consists of water and menthone and is separated as usual. The yield of menthone amounts to 96%.

Example 2.—From a distillation apparatus charged with cyclohexanol a cyclohexanol-steam mixture is passed by means of steam through a tube system filled with dehydrogenating catalysts and heated up to about 180° C., the end of which is provided with an efficient condenser. The condensate consists of water and cyclohexanone and is separated as usual. The cyclohexanone is formed in a 95% yield.

Example 3.—From a distillation apparatus isoborneol is passed by means of steam through a tube system filled with dehydrogenating catalysts and heated to about 180-

195° C., the end of which is provided with a condenser. The solid reaction product obtained consists of about 99.5% camphor.

Example 4.—From a distillation apparatus methyl-phenyl-carbinol is led by means of steam at a temperature of 170-180° C. through a tube system filled with dehydrogenating catalysts, the end of which is provided with an efficient condenser. The condensate consists of water and acetophenone and is separated as usual. The acetophenone is obtained in a yield of 97%.

What I claim is:—

1. A process for the production of ketones from secondary alcohols of the same number of carbon atoms which consists in leading the alcohol in the gaseous state with steam but in the absence of oxygen over dehydrogenating catalysts at a temperature not exceeding 300° C.

2. A process for the production of ketones from secondary alcohols of the same number of carbon atoms which consists in leading the alcohol vapor from a distilling apparatus by means of steam but in the absence of oxygen over dehydrogenating catalysts at a temperature not exceeding 300° C.

3. A process for the production of ketones from secondary alcohols of the same number of carbon atoms which consists in leading the alcohol vapor from a distilling apparatus by means of steam but in the absence of oxygen through a tube system filled with dehydrogenating catalysts at a temperature not exceeding 300° C.

4. A process for the production of ketones from secondary alcohols of the same number of carbon atoms which consists in leading the alcohol vapor and steam from a distilling apparatus in the absence of oxygen through a tube system filled with dehydrogenating catalysts and provided with a condenser at a temperature not exceeding 300° C.

In testimony hereof I hereunto affix my signature this 19th day of May 1930.

HERRMAN SANDKUHL.