

UNITED STATES PATENT OFFICE.

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PROCESS OF MAKING CAMPHOR.

SPECIFICATION forming part of Letters Patent No. 790,601, dated May 23, 1905.

Application filed December 21, 1904. Serial No. 237,831.

To all whom it may concern:

Be it known that we, KARL STEPHAN and PAUL HUNSLZ, chemists, subjects of the German Emperor, residing at the city of Berlin, 5 Kingdom of Prussia, German Empire, have invented a new and useful Improvement in Processes of Producing Camphor from Isoborneol Esters, of which the following is a specification.

10 Our invention relates to the manufacture of camphor by oxidizing isoborneol esters. The use of these esters in place of isoborneol itself has the great advantage that the saponification of the esters which are formed in the 15 production of isoborneol from camphene is avoided.

The oxidation may be performed, for instance, by means of chromic acid, nitric acid, permanganate, manganese, and sulfuric acid, 20 Caro's acid, &c., working either in solution or in suspension.

Example 1: One hundred and twenty-seven parts, by weight, of isobornyl acetate are dissolved in two thousand parts, by weight, of 25 glacial acetic acid or another suitable acid which is not affected by the oxidizing agent and then oxidized with seventy-eight parts, by weight, of chromic acid. The reaction being completed, the excess of the solvent is distilled off, the residue washed out with water 30 and purified in the usual manner.

Example 2: One hundred and twenty-seven parts, by weight, of isobornyl acetate are well mixed with seventy-eight parts, by weight, of 35 chromic acid in two thousand parts, by weight, of water, at about 90° centigrade until no more free chromic acid is present. After cooling, the raw camphor crystallizes out and is then purified in the usual way.

Of course instead of free chromic acid 40 equivalent quantities of chromates and acids may be employed.

The reaction proceeds in an analogous manner if other oxidizing agents are used. In place of isobornyl acetate other isobornyl 45 esters may also be used—for instance, the benzoate or the formate, &c.; but the acetate is preferable on account of its greater accessibility.

If, for instance, isobornyl benzoate be employed, the process is carried out as follows:

Example 3: One hundred and seventy parts, by weight, of isobornyl benzoate are well mixed with seventy-eight parts, by weight, of chromic acid in two thousand parts, by weight, 55 of water at a temperature of about 90° centigrade for so long as no more free chromic acid can be identified. After cooling, the formed raw camphor is separated from the adhering benzoic acid by boiling with alkalies 60 and is further purified in the usual way.

We claim as our invention—

1. The process of producing camphor, which consists in directly oxidizing isoborneol ester and isolating the camphor so formed, substantially as set forth.

2. The process of producing camphor, which consists in oxidizing isoborneol acetate and isolating the camphor so formed, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

KARL STEPHAN.
PAUL HUNSLZ.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT