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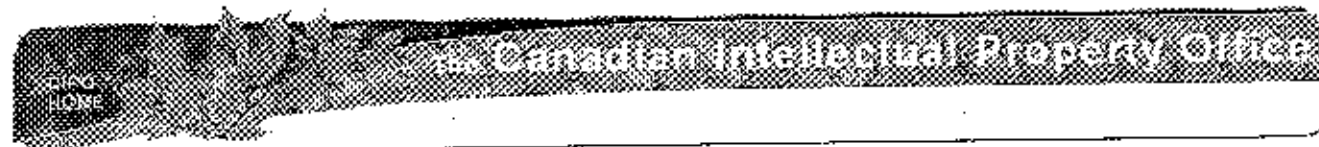
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(12) Patent:

(54) PRODUCTION OF METHYL ALCOHOL BY CATALYSIS AND CATALYSERS PERMITTING TO OBTAIN THE SAME

(54) PRODUCTION D'ALCOOL METHYLIQUE ET CATALYSEUR A CET EFFET

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CLAIMS: [Show all claims](#)

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In the commercial production of methyl alcohol (CH_3O) carbon-monoxide is caused to react with hydrogen 2H_2 under certain physical conditions in the presence of a catalyser, the latter having the effect of lowering the temperature and pressure necessary for the reaction.

If we designate by R the efficiency of a catalyser, by θ_1 the temperature of formation without catalyser, and by θ_2 the temperature of formation in the presence of a catalyser, we have $R = \frac{\theta_1 - \theta_2}{\theta_1}$ the θ being counted in absolute temperatures.

As to the catalyser actually recognized as the most efficient for this reaction, it has been found by experience that $R = 0.465$ this catalyser being constituted by an intimate and very finely ground mixture of 3 molecules of zinc (Zn) and one molecule of chromium (Cr_2O_3); its mass being the 1/112 of the mass of gases in presence (CO and 2H_2); the pressure necessary for the reaction with this catalyser being equal to about 200 atmospheres and the temperature 300 degrees centigrade, or 573° absolute. Under these conditions, the mixture $\text{CO} + 2\text{H}_2$ is transformed almost entirely into CH_3O which can be condensed by means of a suitable device.

The present invention relates to a process of producing methyl alcohol, by using new catalysers and giving comparatively the following results:

One of these catalysers is composed of a very finely ground mixture of strontium (Sr) and oxide of lead (PbO) in the proportion of 3 molecules of (Sr) to one of (PbO) or 4 molecules of (Sr) to one of (PbO). At 300 degrees centigrade methyl alcohol (CH_3O) is

obtained under a pressure of 5 atmospheres and if the operation is carried out at 200 degrees centigrade, 10 atmospheres only will be necessary. Under these conditions it has been found that

$$R = 0.819.$$

Another catalyser according to the present invention consists of a very finely ground zinc and bismuth trioxide in the proportion of 3 molecules of zinc to one of Bi_2O_3 .

By way of example only, a method of procedure is succinctly indicated.

In a metal cylinder made for instance of cast-iron, containing the mixture constituting the catalyser (3Zn + PbO) and enclosing at equal and close distances discs of porous earth dissymmetrically perforated with holes and on which is arranged and fixed the catalysing mixture, is compressed a mixture of CO and of H^2 in the proportion of 1 volume of CO to 2 of H^2 , at the pressure of 5 atmospheres, and if moreover by any device, for instance an electric device, the gases are brought to a temperature of 300 degrees centigrade, it will be observed that the mixture $\text{CO} + 2 \text{H}^2$ will be transformed into methyl alcohol (CH^4O).

In these conditions, the absolute mass of methyl alcohol CH^4O collected in the unit of time, is now only about 7/10 of the mass collected in the case of the catalyser 3 Zn + Cr^2O_3 .

There will be obtained still more considerable lowerings of pressure and temperature but reciprocally lesser productions of CH^4O (methyl alcohol) in the unit of time by using as catalysers either:

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a) a mixture of strontium and lead in the proportion of 4 molecules of strontium to 1 molecule of oxide of lead, or

b) a mixture of zinc and trioxide of bismuth in the proportion 3 molecules of zinc to 1 molecule of trioxide of bismuth (Bi_2O_3).

But generally speaking, it will always be possible to produce the same weight of methyl alcohol, in the same time as with the catalyser $3 \text{Zn} + \text{Cr}_2 \text{O}_3$ by causing the temperature and pressure conditions to vary, but it must be understood that the new values will always be distinctly inferior to those obtained when using the catalyser $3\text{Zn} + \text{Cr}_2 \text{O}_3$.

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HAVING NOW particularly described and ascertained
the nature of my said invention/^{and} in what manner the
same is to be performed, I declare that what I claim
is:

1. Improvements in the production of methyl alcohol (CH_3O) by catalysis by starting from CO and 2 H_2 essentially characterised by the use of new catalysers essentially constituted by a finely ground mixture of strontium (Sr) and oxide of lead (PbO), more especially in the proportion of 3 molecules of strontium to 1 molecule of oxide of lead, or 4 molecules of strontium to 1 molecule of oxide of lead.

2. Improvements in the production of methyl alcohol (CH_3O) by catalysis by starting from its decomposition products CO and 2 H_2 , characterised by the use of new catalysers constituted by a finely ground mixture of zinc (Zn) and of trioxide of bismuth (Bi_2O_3) more especially in the proportion of 3 molecules of zinc to 1 molecule of trioxide of bismuth (Bi_2O_3).

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