

[Second Edition.]

## PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION.



### Improvements in the Manufacture of Catalysts for the Production of Methanol and Higher Alcohols.

We, HAROLD GREVILLE SMITH and REGINALD GEORGE FRANKLIN, both British Subjects, of Norton Hall, The Green, Norton-on-Tees, County Durham, and IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company, of Broadway Buildings, Broadway, Westminster, London, S.W. 1, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to the manufacture of catalysts for the production of methanol and higher alcohols which may be termed for brevity "methanol catalysts".

15 The finished methanol catalysts are characterised by containing a metallic oxide or metallic oxides already known as methanol catalysts.

20 According to the invention the raw material for the preparation of the methanol catalyst which contains some at least of said oxide or oxides in the form of decomposable carbonate, is heated to decompose said carbonates and is then fashioned into pellets or tablets. Tabletting catalysts is broadly known but the

present invention depends on the stated sequence of operations. The heating may be carried out in air or in atmosphere of hydrogen or other gases and the ignited substance subsequently pelleted. The pellets so produced preserve their shape and activity for long periods.

#### EXAMPLE.

35 A catalyst comprising basic zinc carbonate is prepared by adding a solution of soda ash to a solution of zinc sulphate. The mixture is boiled for a few minutes and the precipitate filtered and dried. The mass is then heated in air to a temperature of 300–400° C. until all the carbon dioxide has been driven off, and the product is made into pellets.

Other catalytic oxides may also be introduced into the contact mass, such as those of chromium and manganese.

Dated this 18th day of April, 1928.

W. P. THOMPSON & Co.,  
12, Church Street, Liverpool,  
Chartered & Registered Patent Agents.

### COMPLETE SPECIFICATION.

### Improvements in the Manufacture of Catalysts for the Production of Methanol and Higher Alcohols.

50 We, HAROLD GREVILLE SMITH and REGINALD GEORGE FRANKLIN, both British Subjects, of Norton Hall, The Green, Norton-on-Tees, County Durham, and IMPERIAL CHEMICAL INDUSTRIES LIMITED, a British Company, of Imperial Chemical House, Millbank, London, S.W. 1, formerly of Broadway Buildings, 50–60, Broadway, Westminster, London, S.W. 1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

65 This invention relates to the manufacture of catalysts for the production of methanol and higher alcohols which may be termed for brevity "methanol

catalysts".

The finished methanol catalysts are characterised by containing a metallic oxide or metallic oxides of which various compositions are already known.

70 The heat treatment of a decomposable carbonate to the oxide stage without reference to subsequent pelleting, and the formation of decomposable carbonates into granules followed by heat treatment are already known.

75 According to the invention the raw material for the preparation of the methanol catalyst which contains some at least of a metal oxide or oxides known to be suitable for use as methanol catalysts in the form of decomposable carbonate, is heated to decompose said carbonates

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and is then fashioned into pellets or tablets, if desired after granulation. Tableting catalysts is broadly known but the present invention depends on the combination specified in the claims. The heating may be carried out in air or in atmosphere of hydrogen or other gases and the ignited substance subsequently pelleted. The pellets so produced preserve their shape and activity for long periods.

#### EXAMPLE 1.

A catalyst comprising basic zinc carbonate is prepared by adding a solution of soda ash to a solution of zinc sulphate. The mixture is boiled for a few minutes and the precipitate filtered and dried. The mass is then heated in air to a temperature of 300—400° C. until all the carbon dioxide has been driven off, and the product is made into pellets.

#### EXAMPLE 2.

A hot solution containing zinc and chromium sulphate is run into a solution of sodium carbonate at a temperature of 90° C. The mixture is stirred and then allowed to settle, without boiling at any time, and the precipitate is filtered and washed well with hot water. The precipitate is then dried at 100—150° and the light powder obtained is ground and then granulated in an apparatus in which the dry powder is moistened and the mixture agitated until the required size of granule is obtained. The granules are heated in a furnace for a period of about 3 hours at a temperature of 250—300°, care being taken that the temperature never exceeds 350°. The shrunk granules are made into pellets.

Other catalytic oxides may also be in-

troduced into the contact mass, such as those of chromium and manganese.

We are aware of the prior applications Nos. 290,399 and 295,056 (Synthetic Ammonia & Nitrates Limited and Franklin) and do not claim anything claimed therein.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Process for the production of methanol catalysts consisting of or containing a metal oxide or metal oxides known to be suitable for use as methanol catalysts in which the raw material containing some at least of said oxide or oxides in the form of decomposable carbonate, is heated to decompose the carbonate and subsequently pelleted.

2. Process as claimed in Claim 1 in which the raw material consists of or contains a precipitated carbonate or carbonates.

3. Process as claimed in Claim 2 in which the raw material consists of coprecipitated carbonates.

4. Process as claimed in Claim 1 which includes the further step of granulating the ignited material prior to pelleting.

5. Pelleting methanol catalysts whenever prepared in accordance with the preceding claims.

Dated this 18th day of January, 1929.

W. P. THOMPSON & Co.,

12, Church Street, Liverpool.

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