[Second Edition.]

PATENT SPECIFICATION.

Application Date: April 12, 1929. No. 11,362/29. 334,924

Complete Left: Jan. 3, 1930.

Complete Accepted: Sept. 12, 1930.

PROVISIONAL SPECIFICATION.

Improvements in or relating to the Production of Methanol.

We, BRITISH CELANESE LIMITED, a Company incorporated in accordance with the laws of Great Britain, of Celanese House, 22 & 23, Hanover Square, London, W. 1, WALTER BADER, a citizen of the Swiss Republic, and EDWARD BOADEN THOMAS, a subject of the King of Great Britain, both of the Works of British Celanese Limited, Spondon, near Derby, do hereby declare the nature of this invention to be as follows:—

This invention relates to the production of methanol by the catalytic reduction of oxides of carbon, and is especially applicable to the manufacture of methyl alcohol from gaseous mixtures containing hydrogen and carbon monoxide under high pressure and temperature.

According to the present invention, methanol is synthetically prepared by subjecting gaseous mixtures containing hydrogen and oxides of carbon to the action of heat and pressure in the presence of a catalytic mass comprising the zinc sulphide.

The zinc sulphide may be used alone or in admixture with any of the usual additions made in the preparation of catalytic mixtures for the manufacture of methanol from oxides of carbon and hydrogen, having a basis of zinc oxide. Advantage has been found in the use of zinc sulphide mixed with chromium oxide as a promoter.

The catalyst employed in accordance with this invention does not appear to be detrimentally affected or poisoned by the presence of sulphur in the gaseous mixtures employed. During the course of the reaction, the zinc sulphide catalyst appears to undergo a slight reduction in its content of sulphur, but not to such an extent as materially to alter its character as a sulphide.

The following example is intended to illustrate the invention, but is not to be regarded as limiting it in any way.

EXAMPLE.

An aqueous solution containing zinc nitrate and chromium nitrate in the proportion of about 4 atoms of zinc to 1 atom of chromium is precipitated by the addition of an excess of sodium sulphide in aqueous solution. The precipitate is washed, filtered, pressed and dried, the drying being completed with the aid of heat. The product obtained is employed as a catalyst for the production of methanol under the conditions normally employed in the synthetic production of methanol from gaseous mixtures containing hydrogen and carbon monoxide. The activity of the catalyst increases considerably during the earlier stages of its use. Good results are obtained by conducting the reaction under pressure in the neighbourhood of 100 atmospheres and temperatures of 360—400° C. The product may be purified or deodorised by known processes if a product of a high grade of purity is desired.

The sulphide of zinc can be employed as catalyst either alone or in admixture with such other catalytic agents, or promoters, or carriers, as are applicable to the production of catalytic masses for use in the synthetic manufacture of methanol.

Dated this 10th day of April, 1929.

WHITEHEAD & STEPHENS,
Chartered Patent Agents,
Celanese House, 22 & 23, Hanover Square,
London, W. 1.

COMPLETE SPECIFICATION.

Improvements in or relating to the Production of Methanol.

We, BRITISH CELANESE LIMITED, a Company incorporated in accordance with the laws of Great Britain, of Celanese House, 22 & 23, Hanover Square, London, W.1, WALTER BADER, a citizen of the Swiss Republic, and EDWARD BOADEN THOMAS, a subject of the King of Great Britain, both of the Works of British Celanese Limited, Spondon, near Derby, do hereby declare

[Price 1/-]

Price 4s 6d

Price 5s. 0d.

Price 3s

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:—

This invention relates to the production of methanol by the catalytic reduction of oxides of carbon, and is especially applicable to the manufacture of methyl alcohol from gaseous mixtures containing hydrogen and carbon monoxide under high pressure and temperature.

According to the present invention, methanol is synthetically prepared by subjecting gaseous mixtures containing hydrogen and oxides of carbon to the action of heat and pressure in the presence of a catalytic mass comprising zinc sulphide.

The zinc sulphide may be used alone or in admixture with any of the usual additions made in the preparation of catalytic mixtures for the manufacture of methanol from oxides of carbon and hydrogen, having a basis of zinc oxide. Advantage has been found in the use of zinc sulphide mixed with chromium oxide as a promoter.

The catalyst employed in accordance with this invention does not appear to be detrimentally affected or poisoned by the presence of sulphur in the gaseous mixtures employed. During the course of the reaction, the zinc sulphide catalyst appears to undergo a slight reduction in its content of sulphur, but not to such an extent as materially to alter its character as a sulphide.

The following example is intended to illustrate the invention, but is not to be regarded as limiting it in any way.

EXAMPLE.

An aqueous solution containing zinc nitrate and chromium nitrate in the proportion of about 4 atoms of zinc to 1 atom of chromium is precipitated by the addition of an excess of sodium sulphide in aqueous solution. The precipitate is washed, filtered, pressed and dried, the drying being completed with the aid of heat. The product obtained is employed as a catalyst for the production of methanol under the conditions normally employed in the synthetic production of methanol from gaseous mixtures containing hydrogen and carbon monoxide. The activity of the catalyst increases considerably during the earlier stages of its use. Good results are obtained by conducting the reaction under pressure in the neighbourhood of 100 atmospheres and temperatures of 360—400° C. The product may be purified or deodorised by known processes if a product of a high grade of purity is desired.

The sulphide of zinc can be employed as catalyst either alone or in admixture with such other catalytic agents, or promoters, or carriers, as are applicable to the production of catalytic masses for use in the synthetic manufacture of methanol.

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 manufacture of methanol from gaseous mixtures containing hydrogen and oxides of carbon which comprises subjecting said gaseous mixtures to the action of heat and pressure in presence of a catalyst mass comprising zinc sulphide.

2. Process according to claim 1 and wherein the reaction is performed in presence of a catalyst mass consisting of or comprising a mixture of zinc sulphide and chromium oxide.

3. Process according to claim 1 or 2 and wherein the reaction is performed at temperatures between 360 and 400° C. under pressures of about 100 atmospheres.

4. Process for the manufacture of methanol substantially as described in the Example.

5. Process for the manufacture of methanol substantially as hereinbefore described.

Dated this 2nd day of January, 1930.

WHITEHEAD & STEPHENS,
Chartered Patent Agents,
Celanese House, 22 & 23, Hanover Square,
London, W. 1.

Abingdon: Printed for His Majesty's Stationery Office, by Burgess & Son
[Wt. 33A.—50/12/1930.]