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A Process for the Catalytic Reduction of Oxides of Carbon

Patented in the German Reich as of 18th September 1928

It has been discovered that the hydrogenation of oxides of carbon may, in many cases, be performed in a more advantageous manner, namely by adding hydrocarbons, which are liquid and stable under the reaction conditions, prior to or during the reaction, in sufficient quantities to allow the reaction to be effected within the aforementioned liquid substances. In this procedure, the quantities of liquid are preferably selected in such a way that, for the gas velocity and quantity of gas employed, the liquid is distributed over the entire reaction space. Ideally, a liquid medium shall be chosen which does not decompose under the operating conditions, e.g. anthracene oil. The fact that the reaction is effected in the liquid medium may be derived from the reaction conditions (pressure and temperature) and the saturation vapor pressure of the liquid employed.

Example

A nickel-aluminum catalyst, which is precipitated on diatomaceous earth, is suspended in a heavy oil consisting of

German petroleum, which has been desulfurized by means of catalytic pressure hydrogenation. The catalyst suspension is heated in a vertical reaction vessel to a temperature of 215° and is recirculated in a top to bottom direction. A carbon monoxide-hydrogen mixture is fed through the catalyst suspension counter-currently, causing said mixture to largely be transformed into gasoline-like hydrocarbons, together with methane. In processes where heavy oil is omitted, but conditions otherwise remain identical; the heat tone of the reaction causes a sharp increase in temperature, which results in the increased formation of methane and a sharp decrease in catalyst activity.

PATENT CLAIM:

A process for the catalytic reduction of oxides of carbon, whereby hydrocarbons, which are liquid and stable under the reaction conditions, are added, prior to or during the reaction, in sufficient quantities to allow the reaction to be effected within the aforementioned liquid substances.

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