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PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

An Improved Process for the Production of Low-boiling Hydrocarbons.

We, WILHELM GESSMANN, of Rua Voluntarios da Patria 83 c.8, Rio de Janeiro, Brazil, of Austrian nationality, and EDUARDO WILLIAM SHALDERS, of Rua Voluntarios da Patria 83 c.8, Rio de Janeiro, Brazil, of Brazilian nationality, 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:—

The processes known hitherto for the synthesis of low-boiling hydrocarbons have the great disadvantage of requiring high temperatures and pressures, which disadvantage is obviated by the process forming the subject matter of the present invention.

According to this process a mixture of unsaturated hydrocarbons, preferably acetylene with a gas containing carbon monoxide and hydrogen, such as for example producer gas, water gas or a similar gas obtained from glowing carbon or coke and steam, is passed without heat being supplied, and at normal pressure over a metal catalyst which is subjected at least from time to time to the influence of chemically active rays of light.

A suitable catalyst may be obtained for instance by treating finely powdered, pure electrolytic copper, mixed with tungsten powder and pumicestone powder, with a dilute liquor of at most 10% concentration, composed of caustic soda or caustic potash or a mixture of both, and subsequently drying thoroughly. The catalyst may contain for example 30% copper, 15% tungsten, 49% pumicestone, 4% lithium carbonate and 2% caustic soda.

The process may be carried out for example as follows:—

Several separate layers of the catalyst are arranged on suitable supports in a reaction chamber in such a way that all portions of the gaseous mixture to be treated must come into contact with the catalyst. Each layer can be heated by an electric heating resistance and moreover one or more lamps are arranged in the reaction chamber for treating the catalyst with ultra-violet rays. The catalyst is now heated to about 70°—80° C. and also treated for about 15 mins. with ultra-violet rays. The heating current is then switched off and acetylene and water gas introduced into the chamber through separate supply pipes. 100 parts of water gas are admitted for every 10 parts of acetylene. Immediately following the point of introduction the gases mix together and then pass over the layers of catalyst, where the reaction takes place, a mixture of low-boiling hydrocarbons being formed. The reaction heat liberated thereby is sufficient to keep the catalyst layers at a temperature of 70—80° C. There is no necessity to supply heat from outside. The gaseous and vapourous mixture containing the hydrocarbons formed is then cooled for the purpose of condensing the said hydrocarbons, for instance by means of cooling coils in which cold water circulates and the non-converted primary materials supplied to the process again. The hydrocarbons are separated from the water formed during the reaction by any of the known methods. A very slight pressure may be employed for passing the gaseous mixture through the reaction chamber. The suction action produced by the condensation of the hydrocarbons is however also in itself sufficient. The yield calculated on carbon amounts to 85—90% of the carbon contained in the original gaseous mixture. It has been found in the experiments that the catalyst remains effective for two hours after having been irradiated for ¼ of an hour. After this period has elapsed, the radiation is repeated. Naturally however if desired, the radiation may be carried out continuously or with shorter or longer time intervals, according to the working conditions. Other metals may also be used as catalyst.

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

1. A process for the production of low-boiling hydrocarbons, characterised by the feature that a mixture of unsaturated

hydrocarbons with a gas containing carbon monoxide and hydrogen is passed without heat being supplied and at about normal pressure over a metal catalyst, which is subjected at least from time to time to the influence of chemically active rays of light.

2. A process as claimed in Claim 1, characterised by the feature that use is made of a catalyst, which consists of pure, powdered electrolytic copper, mixed with tungsten and pumicestone powder, which mixture is treated with a dilute caustic alkali liquor and then dried thoroughly.

3. The improved process for the production of low-boiling hydrocarbons, substantially as hereinbefore described.

Dated this 29th day of June, 1927.

MARKS & CLERK.

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