Industry Canada Industrie Canada

Canada

strategis.gc.ca Strategis Index:

CIPO OPIC

CIPO HOME The Canadian Intellectual Property Office

Canadian Patents Database

12/20/2001 - 16:08:42

(12) **Patent:** (11) **CA 535631**

(54) PROCESS FOR CARRYING OUT THE HYDROGENATION OF CARBON MONOXIDE

(54) PROCEDE POUR METTRE EN PRATIQUE L'HYDROGENATION D'OXYDE DE CARBONE

(72)	(Country):	**HERBERT KOLBEL** (Not Available) **FRIEDRICH ENGELHARDT** (Not Available)
(73)	(Country):	**STEINKOHLENBERGWERK RHEINPREUSSEN**
(71)	(Country):	
(74)		
(45)		**Jan. 8 , 1957**
(22)		
(43)		
(52)		**260/678.8**
(51)		**N/A**
		No
(30)		**None**
		N/A
		Unknown

*** Note: Data on abstracts and claims is shown in the official language in which it was submitted.

View or Download Images :

- (•) Cover Page Image
- ( ) Abstract Image
- ( ) Claims Image
- ( ) Disclosures Image
- ( )

The invention relates to a process for carrying out the synthesis of hydrocarbons by the hydrogenation of carbon monoxide in the presence of iron catalysts at normal pressures.

It is known that the hydrogenation of carbon monoxide in the presence of iron catalysts is more difficult to effect at normal pressure than at elevated pressure. The cause or causes of such difficulty or difficulties have not, however, hitherto been discovered.

It has now been found that the extent of the conversion of carbon monoxide and the life of the iron catalyst are considerably influenced by the partial pressure of water vapour of the gases entering the reaction chamber or reactor, that is to say, by the partial pressure of water vapour in the fresh synthesis gases, as well as by the partial pressure of water vapour in the recycle gas when the synthesis gases are recycled or, when the hydrogenation of carbon monoxide is effected in several stages, by the partial pressure of water vapour in the exit gases which are passed from one synthesis stage to the next synthesis stage.

When, for example, a synthesis gas having a partial water vapour pressure corresponding to the saturation pressure of water at 18°C is passed over a precipitated iron catalyst (100 parts by weight of iron, 65 parts by weight of sintered dolomite, 7.5 parts by weight of copper, 2 parts by weight of potassium carbonate) which had not been pre-treated,

the carbon monoxide conversion attains a maximum of 40% when 12 litres of synthesis gas, containing hydrogen and carbon monoxide in the ratio of 1.7 : 1, are introduced per hour together with 10 grams of iron at an operating temperature of 225°C, the synthesis gas being recycled in the ratio of 1 volume of fresh gas to 3 volumes of recycle gas. If the synthesis gas is dried by means of calcium chloride however, the water vapour in the recycle gas being also fixed or bound by activated carbon, the carbon monoxide conversion will, with the other reaction conditions remaining the same, attain a maximum of 80% after about 40 hours.

The effect of drying the gas becomes more pronounced the greater the proportion of hydrogen present in the synthesis gas which is reacted in the presence of the iron catalyst.

According to more accurate observations, an effect is noticeable when the gases used for the synthesis are dried at a pressure just below the appropriate saturation pressure for 30°C (32mm.Hg. approximately). It is particularly advantageous to use, in the process according to the invention, synthesis gases, the partial water vapour pressure of which is within the range 2 - 15mm. Hg.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A process for the synthesis of hydrocarbons by reducing carbon monoxide at normal pressures in the presence of an iron catalyst, in which the partial water vapour pressure of the fresh, recycle or exit gases entering the reactor is maintained below the saturation pressure of water vapour at $30^{\circ}C$.

2. A process according to claim 1, in which the partial water vapour pressure of the gases lies within the range 2 - 15 mm. Hg.