

INFORMATION DIVISION TRANSLATION T47-23

API-TQM Reel 48, Frames 742-743

Reduction of the Cobalt Catalyst

1) General

The reduction is carried out outside the synthesis oven in a special reduction oven. This is done for several reasons:

- a) By the separate carrying out of the reduction and the synthesis each in a special oven, the oven-temperatures and the flow-rates of the gases can be more easily kept constant. Thus the reduction-and the synthesis-conditions can be easily duplicated.
- b) Because of the larger diameter of the reduction tube (21 mm) the length of the layer of grains to be reduced is decreased to about 1/3 of the length of the layer in the synthesis tube. Thus the decline in the reduction value in the length of the layer is considerably less. Therefore one obtains a more constant reduction value.
- c) The time until a test with a synthetic gas can be incorporated is considerably reduced.

2) Apparatus

- a) An aluminum block-oven with a block-length of 1 m. Temperature regulators are attached on both sides in order to maintain uniform temperatures.
- b) Supremax glass tube with inside diameter of 21 mm and approximate length of 1.5 m.

3) Executions:

The desired amount of the catalyst is separated, i.e. as much as corresponds to 4 g Co (appr. 15-20g) or of a definite volumetric amount.

~~This amount is filled into the Supremax glass tube in such a manner that the layer comes to lie in the last part of the oven (in the direction of the gas.) The catalyst is held fast on both sides by a plug of glass wool which is as even as possible.~~

After rinsing with hydrogen, the glass tube is pushed into the reduction oven which has been heated to constant temperature.

We now differentiate between two types of reduction,

- 1) normal reduction  
½ hour at 350°C and 300 l. H<sub>2</sub>/hour
- 2) intensified reduction  
2 hours at 400° and 300 l. H<sub>2</sub>/hour

After the reduction is completed, the glass tube is taken from the oven and left to cool in a stream of H<sub>2</sub>. The normal reduction leads to a reduction value of approximately 75%, the intensified reduction to a reduction value of 100%.

The normal reduction is used for all normal laboratory tests, the intensified reduction for all operating tests.

In cases of intensified reduction, catalysts with weak catalytic effect show the decline earlier in contraction measurements and oil yield, thus reducing the testing-time. Good catalysts show no difference between normal and intensified reduction in up to 500 operating hours.

/s/ Roelen

Translated by E. Rothstein, March 4, 1947

Checked by C.C.M., March 6, 1947

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