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BRIEF OF PARTIAL REPORT

Laboratory Montebello Experiment No. 2001
Date Approved September 15, 1955 Partial Report No. 1
Date Work Completed October 13, 1951 Subject: Hydrocarbon
Synthesis

Subject: Hydrocarbon Synthesis: Montebello Runs No. 58, 59, 60, 61, and 62; CM&S Catalyst.

Object: To test ammonia-synthesis catalysts for hydrocarbon synthesis.

History: Hydrocarbon Research, Inc., obtained high sustained liquid yields in a pilot unit using a powdered ammonia-synthesis catalyst for synthesizing hydrocarbons from carbon monoxide and hydrogen. Since this yield level had never been attained at Montebello using other catalysts, the decision was made for Montebello Laboratory to test some ammonia-synthesis catalysts for hydrocarbon synthesis.

Experimental Work: Runs 58, 59, 60, 61, and 62 were made between May 4, 1951, and October 13, 1951, using both new and spent catalysts of the fused iron-alumina-silica-potassia type prepared by Consolidated Mining and Smelting Company. The catalysts were charged to Montebello reactor 5S, reduced with hydrogen at 200 psi and 700 to 800°F. Synthesis feed gas was obtained by using the Texaco Synthesis Gas Generation Process with natural gas and oxygen in a 2-cubic-foot generator. A water wash tower was used to remove traces of carbon and to cool the feed gas to facilitate measurement.

Conclusions: 1. The five runs made with CM&S catalysts resulted in wide variations in yield of liquid product.
2. The liquid yields did not show the same correlation with space velocity and catalyst particle size that was exhibited with magnetite and mill scale catalysts.
3. The best run, Number 59, had a C₃+ yield of approximately 9.0 lbs/MCF H₂+CO. The distinguishing features of the catalyst in Run 59 were:
a) The catalyst had previously been used in ammonia synthesis.
b) It was essentially fully reduced when received at Montebello.
c) No potassium carbonate was added to the catalyst as received.

FIH-(WEK-WAMcM)-GK-WJC(2)-RWH-HDM(2)-RLSr(2)-duBE(2)

JCW-CEL

RP

WMS

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HYDROCARBON SYNTHESIS

PARTIAL REPORT NO. 1

Montebello Research Laboratory

Work Completed: October 13, 1951

Experiment No. 2001

Report Approved: Sept. 15, 1955

MONTEBELLO RUNS NO. 58, 59, 60, 61, and 62

CM AND S CATALYST

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