

DISCUSSION

The data obtained in Run 15 show that a satisfactory oil yield and catalyst life can be obtained when charging catalyst batch-wise and operating with an inlet velocity of 1.8 ft./sec. with an open reactor without catalyst return over a period of 200 to 250 hours. This is not regarded as a particularly desirable method of operation but is considered entirely feasible.

The low carry-over rates are believed to be characteristic of this catalyst and are believed to demonstrate that the high rates of catalyst circulation previously encountered merely show that excessively fine catalyst returned to the reactor is immediately discharged again, setting up a catalyst circulation so that the rates of carry-over in a system equipped for catalyst return are far above those in a system where the fines are not returned. This run shows that satisfactory yield and catalyst life can be obtained without catalyst return. Since rates of carry-over are very sensitive to reactor velocity, longer or shorter catalyst life can be obtained

by varying this factor. This puts a premium on uniformity of flow through the reactor and it is expected that somewhat lower loss rates will be obtained in the future by reducing the pressure surges which have previously been experienced when the secondary cyclone trap is discharged.

Run 15 was terminated by a sudden loss of bed temperature and a correspondingly sudden reduction in steam production and increase in wet gas rate. While it is possible that this effect may have resulted from a leak in the steam cooling system, this is not thought to be the case and the effect is thought to represent a critical space velocity which, for this catalyst, was on the order of 160 cu.ft./hr./lb. of catalyst.

MONTEBELLO SYNTHESIS UNIT
SUMMARY OF PRELIMINARY DATA

RUN NUMBER	15A	15B	15C	15D	15E
Start	4/7	4/8	4/9	4/10	4/11
End	4/8	4/9	4/10	4/11	4/12
GENERATOR DATA					
Gas Rate-scfh	2620	2600	2520	2520	2455
Oxygen Rate-scfh	1820	1915	1880	1900	1848
Product Rate-scfh	7780	8110	7650	8000	7300
Product Composition by Corrected Explosion Orsat- mol %					
CO	31.1	31.8	34.8	33.2	34.8
H2	57.4	59.9	58.4	60.0	58.0
CO2	2.4	2.5	2.3	2.1	2.3
N2	2.2	1.7	2.1	2.2	2.2
CH4	6.9	4.1	2.4	2.5	3.3
SYNTHESIS DATA					
Pressure-psig	200	200	200	200	200
Recycle Rate-scfh	12175	11410	11360	10700	12118
Fresh Feed Rate-scfh	7780	8110	7650	8000	7300
Wet Gas Rate-scfh	2080	1855	2005	2120	2550
Catalyst Temperature F.	618	620	623	630	630
Catalyst Density-#/cu.ft.	45	25	24	22	20
Cat. Fluidized-#	268	255	208	185	166
Depth of Bed-ft.	14	16	18	18	19
Fresh Feed-cfh/# cat.	29	32	37	43	44
Inlet Velocity-ft./sec.	1.7	1.7	1.6	1.5	1.8
Recycle Ratio	1.6	1.4	1.5	1.3	1.7
Contraction-%	73.0	77.0	73.8	73.5	65.0
Measured Oil-gph	4.6	5.9	4.5	5.4	4.2
Measured Water-gph	9.4	10.0	8.9	7.9	7.3
Steam Pressure-psig	925	925	925	925	925
Steam Rate-#/hr. (1)	358	349	284	300	280
YIELDS ESTIMATED FROM CORRELATION					
CO Conversion-%	96.3	97.5	96.6	96.5	93.4
H2 Conversion-%	81.8	86.0	82.7	82.3	72.9
Ultimate Oil Yield					
bbl./MMCF Gen. Feed	119	125	120	120	105
Cumulative Ultimate Oil					
bbl./MMCF Gen. Feed	119	122	121	121	118
gal./# cat. charged	1.2	2.4	3.5	4.7	5.7

(1) Sight average from badly pulsating chart