

## II. EQUIPMENT AND MATERIALS

Runs 63, 64, 65, and 66 were made in Reactor No. 5S<sup>1</sup>, a vessel 12.5 inches in diameter by 30 feet tall with a sparger at the bottom for better inlet gas distribution. For comparison purposes, some data are included from Run 55<sup>a</sup> made in Reactor No. 5C. That reactor was the same as No. 5S except that it had a 60-degree cone instead of a sparger at the bottom.

The synthesis gas feed 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 on the synthesis gas in all runs except No. 55.

The catalyst used in Run 63 was Bethlehem mill scale, sized, promoted, and reduced at Brownsville. It was shipped to

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<sup>1</sup>For description and drawing, see TDC 802-50-P.  
<sup>a</sup>Ibid.



TABLE I  
SUMMARY OF DATA AND OPERATING CONDITIONS

Period	Hours on Stream	Average Catalyst Age, Hours	Fresh Feed Rate, <sup>1</sup> MSCFH	Recycle Ratio	Bed Depth, Feet	Space Velocity v/hr/v	Inlet Pressure psig	Conversion H <sub>2</sub> + CO Per Cent	Selectivity C <sub>3</sub> +/C <sub>1</sub> + Per Cent	Activity Index <sup>2</sup>	Yield C <sub>3</sub> + lbs/MCF <sup>3</sup> H <sub>2</sub> +CO	BPD Brownsville Basis
63-0	0-96	48	15.7	0.97	20.6	1118	414	86.16	79.77	28.73	9.18	7221
-1	96-216	156	16.0	0.96	20.6	1152	413	84.87	78.05	27.84	8.73	6737
-2	216-336	276	16.2	0.99	19.3	1237	406	80.39	76.30	24.90	8.13	6148
64-0	0-106	53	15.2	1.05	18.2	1229	416	84.00	80.18	27.90	8.90	6930
-1	106-194	150	15.7	1.02	18.9	1226	416	82.40	78.56	26.41	8.51	6518
-2	194-290	242	15.5	1.08	19.7	1156	414	80.56	77.44	24.18	8.11	6148
-3	290-386	338	15.6	1.07	19.8	1156	413	79.15	76.29	23.15	7.84	5866
65-0	0-112	56	15.8	1.02	18.3	1281	416	85.10	78.44	29.59	8.80	6836
-1	112-232	172	15.5	1.05	18.8	1214	414	82.77	77.37	26.61	8.43	6446
-2	232-326	279	15.4	1.04	18.7	1222	410	79.05	75.67	23.73	7.80	5871
66-0	0-94	47	16.4	0.95	19.0	1272	404	83.06	80.04	27.50	8.81	6823
-1	94-207	150	15.7	0.97	18.7	1241	403	81.73	77.71	26.01	8.33	6310
-2	207-296	252	15.0	1.03	18.7	1179	403	80.59	75.40	24.45	8.10	6122
-3	296-416	356	14.3	1.07	18.6	1125	401	79.78	75.50	23.28	8.02	6003
-4	416-500	458	15.2	1.05	16.3	1369	398	72.84	74.83	20.94	7.03	5212
-5	500-619	560	15.0	2.09	8.2	2668	404	72.28	79.56	28.79	7.72	5819

<sup>1</sup>MSCFH = thousand standard cubic feet per hour, based on 60°F and 14.73 psia.

$$^2 \text{Activity Index} = \sqrt{v/h/v} \log \left( \frac{100}{100 - \text{conversion}} \right)$$

Exp. No. 2001-2-P-4

Montebello in sealed, stainless steel drums and loaded into the reactor in air-tight cans pressured with cylinder nitrogen. The nitrogen was obtained from Air Reduction Company.

The catalysts used in Runs 64, 65, and 66 also were received from Brownsville, but in the unreduced state. They were reduced in the Montebello reactor at, respectively, 730°F, 800°F, and 650°F average bed temperature.<sup>1</sup> Linde cylinder hydrogen was used for reducing the catalyst.