Table 1
Results of Synthesis Experiments at High Space Velocities

Catalyst	IRON (SYNTHETIC-AMMONIA)															COBALT						
Type of process	FIXED BED													FLUID BED		FIXED BED						
Experiment number	12/26											12/28		16/2		10A/30		10A/34				
Time in days from start of synthesis	9	16	20	36	68	73	80	90	93	107	124	18	21	1-5	6-9	35	42	37	41	47	52	64
Reaction pressure, atmos. gauge	10	20	20	20	20	20	20	25	25	25	25	20	20	20	20	10	10	10	10	10	10	10
Reaction temperature °C.	285	280	288	281	292	308	318	295	308	312	330	300	300	300	300	208	220	215	220	230	240	260
H_2: CO Ratio of synthesis gas	2.03:1													2.31	2.34	2.05:1						
Synthesis gas space velocity, vol./vol. catalyst/hr	418	416	644	398	530	530	1050	530	688	556	1040	533	680	793	1019	366	510	353	516	526	500	538
Recycle ratio, vol. residual gas vol. syn. gas	--	--	--	2.23	2.18	2.26	1.33	2.24	2.13	2.16	1.32	2.18	2.03	7.1	6.1	--	--	2.39	2.16	2.21	3.30	1.44
Gas Contraction, per cent	48.2	55.4	51.6	74.0	71.0	79.6	72.6	76.3	75.6	76.2	65.5	76.6	79.0	83.0	82.7	74.5	74.0	75.5	76.1	74.8	76.1	68.0
CO converted, percent	95.8	96.2	93.4	95.5	91.5	96.0	94.4	93.0	91.7	93.1	90.2	98.2	97.5	99.1	99.5	78.1	83.0	80.0	79.3	79.7	82.3	83.6
CO converted to CO_2 per cent of total	29.2	23.2	23.9	7.5	6.6	5.2	9.2	4.4	4.8	3.4	8.1	6.2	5.6	nil	nil	nil	4.2	nil	nil	nil	nil	9.2
CO converted to CH_4 per cent of total	17.1	14.3	11.7	12.0	11.2	12.4	12.9	10.6	9.6	13.8	13.6	18.8	15.5	19.9	20.9	18.7	26.9	14.5	23.9	28.4	36.1	54.0
CO converted to higher hydrocarbons percent of total	53.7	62.5	64.4	80.5	82.2	82.4	77.9	85.0	85.6	82.8	78.3	75.0	78.9	80.1	79.1	83.3	68.9	85.5	76.1	71.6	63.9	36.8
Utilisation ratio, vol. H_2 vol. CO	1.14	1.29	1.15	1.75	1.68	1.83	1.71	1.78	1.77	1.81	1.58	1.82	1.88	2.23	2.30	2.22	2.23	2.10	2.23	2.29	2.30	2.22
Yield CH_4 g., N.cu.m. synthesis gas	36.7	30.9	24.8	25.2	23.2	27.4	28.0	22.6	20.2	29.0	27.6	41.5	33.7	40.2	42.4	32.8	50.0	26.9	42.6	50.0	65.6	101.6
Yield of C2 to C4,g., N.cu.m. synthesis gas	56.6	76.3	77.2	53.6	75.0	71.4	85.0	87.7	92.5	85.4	82.4	87.9	71.8	104.4	106.7	34.3	32.0	74.0	64.4	60.7	68.2	28.0
Yield of liquid hydrocarbons, g., N.cu.m. synthesis gas	47.3	44.9	45.7	97.9	77.4	91.5	67.1	77.8	72.2	70.5	60.0	62.6	81.7	33.3	31.7	96.8	83.0	67.7	54.9	52.0	35.3	34.0
Yield of total higher hydrocarbons, g./N.cu.m. synthesis gas	103.9	121.2	122.9	151.5	152.4	162.9	152.1	165.5	164.7	155.9	142.4	150.5	153.5	137.7	138.4	131.1	115.0	141.7	119.3	112.7	103.5	62.0