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FLASH HYDROLYSIS OF COAL

QUARTERLY REPORT NO. 11

OCTOBER 1 - DECEMBER 31, 1979

MEYER STEINBERG

PETER FALLON

BHARAT L. BHATT

February 1980

DEPARTMENT OF ENERGY AND ENVIRONMENT

BROOKHAVEN NATIONAL LABORATORY

UPTON, NEW YORK 11973

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TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	v
I. OBJECTIVE AND SCOPE OF WORK	1
II. TUBULAR REACTOR EXPERIMENTAL RESULTS	1
Work Accomplished	1
a) Hydrogasification of Bituminous Coal	1
b) Hydrogasification of New Mexico Sub-Bituminous Coal at High Coal Feed Rate and Low Hydrogen to Coal Ratio	4
c) Hydrogasification of New Mexico Sub-Bituminous Coal at 950°C	5
d) Hydrogasification of Wyodak Lignite	5
e) Hydrogasification of Na ₂ CO ₃ Treated New Mexico Sub-Bituminous Coal	5
Work Forecast	
III. PRODUCT ANALYSES AND MATERIAL BALANCES	6
Work Accomplished	
Work Forecast	6
IV. REACTION MODELLING AND DATA CORRELATION	7
Work Accomplished	7
Work Forecast	7
V. EXPERIMENTAL EQUIPMENT AND MODIFICATION	8
VI. CONCLUSIONS	8
VII. REFERENCES	10
VIII. OTHER PUBLISHED REPORTS	11
Tables	13
Figures	17
Appendix	19
Distribution List	113

LIST OF TABLES

Table No.

1. Ultimate Analysis (wt PCT dry) of Coals Used Experimentally.	13
2. Hydrogasification of Illinois No. 6 Coal.	13
3. Hydrogasification of Illinois No. 6 Coal.	14
4. Hydrogasification of New Mexico Sub-Bituminous Coal at High Coal Feed Rate and Low Hydrogen to Coal Ratio.	15
5. Hydrogasification of Wyodak Lignite.	16
6. Char Sulfur Retention in Illinois No. 6 Coal Experiments.	16

LIST OF FIGURES

Figure No.

1. Hydrogasification of New Mexico Sub-Bituminous Coal, Fraction Carbon Converted to Gaseous HC (CH_4 and C_2H_6) vs. Temperature, Pressure-1000 to 2500 psi.	17
2. Hydrogasification of New Mexico Sub-Bituminous Coal Containing 10 wt% NaCO_3 , Fraction Carbon Converted vs. Temperature, Pressure-1000 psi.	18

Summary

The detailed study of the hydrogasification of caking bituminous coal has been initiated. Two coals were used, Illinois No. 6 and Pittsburgh No. 8. The coals were used with diluents of limestone and sand, in order to avoid any effects pretreatment to render the coals non-caking may have on experimental results. Up to 40% Illinois No. 6 coal could be used with either diluents but only 20% Pittsburgh No. 8 could be used, probably due to its higher free swelling index (3 vs. 2). Most of the experiments were conducted at 900°C and 1000 psi to maximize gaseous hydrocarbon yields. Using Illinois No. 6, it was found that the gaseous HC yields from experiments using limestone were greater than for those using sand (34-43% vs. 27-31%) and that considerable BTX is also produced (8-13%). At 850°C where experience with other coals gave increased BTX yield, no increase was observed for this coal. Although the data from experiments using Pittsburgh No. 8 coal is inconclusive, there appears to be a significant similarity in yields from the two coals with the Pittsburgh No. 8 producing slightly more methane.

The amount of total sulfur from the coal feed that was retained in the char was observed to be considerably greater when limestone was used as a diluent than when using sand. When the char from one experiment using limestone was used as the diluent for a second experiment and this char again used as the diluent for a third experiment, sulfur retention in the char, continually increase.

Hydrogasification of New Mexico sub-bituminous coal at 900°C and 1000 psi at a coal feed rate of 10.7 lb/hr and a H₂/coal ratio of approximately 0.06 gave a similar yield (27% CH₄ and C₂H₆) as that obtained at 2.4 lb/hr and the same H₂/coal ratio. However, the BTX

yield did increase from 1.1% to 5.4%. The concentration of gaseous HC's was up to 45% by volume. In one experiment the hydrogasification of this same coal at 950°C gave lower yields than observed at 900°C. When the sub-bituminous coal was treated with 10% Na₂CO₃ and studied between the temperature of 600°C and 900°C at 1000 psi, no appreciable difference in yields was seen than when using the coal untreated.

Hydrogasification of Wyodak lignite yielded approximately the same results as North Dakota lignite with the exception that more BTX was produced at the expense of light oils ($\geq$ C₉).

I. OBJECTIVE AND SCOPE OF WORK

The program objective is to develop process chemistry and design information and to investigate methods for improving yields and process conditions for the rapid hydrogasification of coal. The rapid hydrogasification or hydrolysis of coal (1,2) is a fast gas phase, non-catalytic direct coal conversion technique for the formation of gaseous hydrocarbons and significant quantities of aromatic liquid hydrocarbons. The work includes the design, construction, and operation of a 1 lb/hr down-flow entrained tubular reactor system capable of operating at up to 900°C and 4000 psi and incorporating on-line product analysis. The experimental unit is used to study the effect of such process variables as temperature, pressure, feed rates, residence time, coal type and feed gas composition on the yields of liquid and/or gaseous hydrocarbon products. Complete mass balances of feed to product are made, the data are correlated and modelled for determination of rate equations.

II. TUBULAR REACTOR EXPERIMENTAL RESULTS

Work Accomplished

a) Hydrogasification of Bituminous Coal

The major effort during this report period centered on the hydrogasification of two caking eastern bituminous coals, Illinois No. 6 and Pittsburgh No. 8, the analyses of which are given in Table 1. In order to eventually be able to compare the results obtained with those from the two previous coals studied in detail, North Dakota lignite and New Mexico sub-bituminous, it was decided to use diluents in the coals rather than treat them to render them non-caking. Dilutions of 10 and 20%

Illinois No. 6 coal in limestone were tried initially and fed well through the reactor without causing agglomeration. Dilutions of 40, 50 and 60% were then tried. The 40% coal mixture fed as well as the two previous mixtures: the 50% mixture fed well but caused intermittent plugging in the reactor; and the 60% mixture plugged the reactor solid. Since the 40% coal mixture produced the best results with a reasonable concentration of coal, it was decided to use this mixture in most future experiments. This mixture was also found to feed equally as well when fine sand was used as a diluent. In similar experiments with Pittsburgh No. 8 coal, the highest coal concentration that fed well without causing plugging of the reactor was only 20%. This is probable due to the higher free swelling index of the Pittsburgh No. 8 as compared to the Illinois No. 6. (3 vs. 2).

Table 2 gives a summary of the result of 3 experiments using Illinois No. 6 coal in a 40% mixture with limestone, 2 experiments in a 40% mixture with sand and 1 experiment in a 50% mixture with limestone. All but one of these experiments were conducted at 900°C and 1000 psi, the other was conducted at 850°C to determine if more BTX would be produced at a slightly lower temperature. From the results shown in Table 2 it can be seen that the gaseous HC yield from the experiments using limestone as a diluent were greater than those using sand (34-43% vs. 27-31%) and that even at 900°C, considerable BTX is produced (8-13%). At 850°C, the BTX yield was the same (8%) as the lowest yield of this product obtained at 900°C. A significant difference in products observed at 850°C was the 6% yield of ethane and a decrease in methane. In these experiments there was no significant production of liquids of molecular

weight greater than C_9 . It should be noted that in all cases, the percent carbon converted is based on the carbon in the coal.

Table 2 also shows the maximum gasification yields which occur at approximately 5 seconds coal particle residence time in the reactor. The percentage of total sulfur fed to the reactor that is retained in the char is seen to be considerably greater when limestone is used as a diluent as compared to sand. This indicates that sulfur in the coal is retained by the limestone, probably as a sulfide in the highly reducing atmosphere in the reactor.

To date the data obtained from experiments using Pittsburgh No. 8 is inconclusive because the majority of this data is from experiments conducted using a 40% mixture where some plugging was encountered. The remaining experiments were performed with 10 and 20% mixtures which results in a very low concentration of carbon in the feed mix which is also partly due to the ash content of this coal ($\approx 33\%$). Although more work is necessary, there appears to be a significant similarity in yields from the two coals. The Pittsburgh coal produces slightly more methane than the Illinois coal regardless of whether sand or limestone is used as a diluent.

In another series of experiments using Illinois No. 6, the residue or char from one experiment was mixed with 40% fresh coal and fed to the reactor and the residue from that experiment was again mixed with fresh coal for a third experiment. The purpose was to approach the type of conditions that would be encountered if fresh coal were fed to a large mass of limestone similar to that in fluidized bed combustion. Also of interest was the retention of sulfur in the char and whether it would

continue to retain sulfur. From Table 3 an increase in gaseous hydrocarbons is seen for each succeeding experiment (34%-39%-46%) possibly due to the reactivity of the residual carbon in the char. Although the BTX yield was the greatest in the first experiment using fresh limestone (12.7%) no trend was observed. The CO-CO₂ yield decreased significantly from the first fresh limestone feed and continued to decrease slowly with each succeeding experiment as would be expected if the carbonate was decomposing to CaO and CO₂. The sulfur retention did improve, indicating the limestone-lime maximum retention ability had not been reached. Also in a subsequent but not totally successful experiment using the char from the last experiment, run 323, 94% of the sulfur was retained. Additional experiments will be performed with recycled char and lime diluent to determine the effects on the yield.

b) Hydrogasification of New Mexico Sub-Bituminous Coal at High Coal Feed Rate and Low Hydrogen to Coal Ratio

In Table 4 is shown the results of two experiments conducted at 900°C and 1000 psi with a H₂/coal ratio of approximately 0.06. In the first experiment, the coal feed rate was 2.4 lb/hr and in the second 10.7 lb/hr, more than 4 times as great. Aside from the BTX yield which was greatest for the higher coal feed rate (1.1% vs 5.4%) the other products were approximately the same (27% gaseous HC and 4-5% CO_x) no liquid heavier than BTX were observed. The BTX yield of 5.4% is the most observed for this coal at these conditions. Even at the high coal feed rates of 10.7 lb and 2.4 hr in the 1" I.D. reactor the void fraction was calculated to be 0.994 and 0.998 respectively indicating a dilute phase operation. The gaseous HC's concentration in the product stream was

fairly high (42.8 and 45.5%) as would be expected at similar H_2 /coal ratios.

c) Hydrogasification of New Mexico Sub-Bituminous Coal at 950°C

Since experiments with New Mexico sub-bituminous coal at temperatures up to 900°C showed the gaseous hydrocarbon products to be continually rising particularly at 1000 psi (Figure 1), one experiment was conducted at 950°C and 1000 psi to test this trend. The yields were less than that observed at 900°C (52% vs 42%) and there was very little ($\approx 1\%$) BTX produced. At 900°C as much as 5% BTX has been observed. Additional experiments are needed to clarify these results.

d) Hydrogasification of Wyodak Lignite

Three experiments were conducted using a Wyodak lignite as an alternate to the North Dakota lignite previously studied.⁽³⁾ The results are given in Table 5. The gaseous hydrocarbon yields agree well with those obtained from the North Dakota lignite but the BTX yields were much greater at 900°C and 1000 psi (9.0% vs. 2%). At 725°C to 750°C and 2000 psi the BTX yields were only slightly greater than those from the other lignite and the light oils were much less (2% vs. 9%).

e) Hydrogasification of Na_2CO_3 Treated New Mexico Sub-Bituminous Coal

When this sub-bituminous coal, treated with Na_2CO_3 was tested at 900°C and 1000 psi in the last report period⁽⁴⁾ little difference was observed between the hydrocarbon yields obtained with the treated and untreated coal. As a further test of the catalytic effect of Na_2CO_3 , a sample of the same coal treated with 10% Na_2CO_3 , as previously, was tested in the system at 1000 psi and 600°C to 900°C. The procedure was to slowly increase the temperature while monitoring the product yields via use of

the on-line gas chromatograph. A total of 16 samples were taken and the results are shown in Figure 2. The BTX yield reached a maximum of 8% at 870°C as compared to 7% previously reported for untreated and treated coal. The gaseous hydrocarbons are seen to be continually increasing beyond the 51% observed at 900°C. The untreated coal gave an average yield of 54% gaseous HC. The coal will be run at temperatures above 900°C to further test for any catalytic effect.

Work Forecast

The experiments using bituminous coals and diluents will continue. Pretreatment of these caking coals to render them non-caking will be tried. Also steam will be used with and without hydrogen while feeding a non-caking coal. The Na_2CO_3 treated bituminous and will be tried at 950°C.

III. PRODUCT ANALYSES AND MATERIAL BALANCES

Work Accomplished

Since the major effort during this report period was on the hydrogasification of bituminous coal and the disposition of the sulfur in this coal, most of the analytic effort was devoted to sulfur analyses. Table 6 gives a summary of these analyses which were discussed above. As can be seen from this table, the sulfur is constantly increasing in the char from each succeeding experiment where the char from the previous experiment is used as the diluent. Also increasing is the percentage of the total sulfur fed that remains in the char. When calculations were made of the percentage of the sulfur from the fresh coal being added that was found in the char, the results were somewhat scattered. However, they did average to a value of approximately 70% retention which agrees reasonably well with runs 311 and 326 (77 and 80%)

when no char was used. The table also shows the sulfur retention to be much greater in the experiments using limestone than when using sand.

Work Forecast

Sulfur analyses will continue and will include more complete balances by analysis of the water produced and if possible, the gaseous effluent.

Carbon balances will be made on experiments using caking bituminous coal.

IV. REACTION MODELLING AND DATA CORRELATION

Work Accomplished

A report entitled "Reaction Modelling and Data Correlation for Flash Hydropyrolysis of Lignite" is completed and will be published shortly. The report contains modelling and correlation of data from 83 experimental runs using North Dakota Lignite for a hydrogen to coal weight ratio of approximately 1, the activation energies and pre-exponential factors were determined. Design curves were developed from the kinetic parameters and the rate expressions for CH_4 , C_2H_6 , BTX and oils, for conversions in the range of 500-3000 psi, 700-900°C, 0-12 sec particle residence time and 0-57 sec gas residence time.

Work Forecast

The conversion data obtained from hydrogenation experiments using sub-bituminous coal will be correlated using similar techniques. The results obtained will be compared with those obtained from analysis of data for lignite.

V. EXPERIMENTAL EQUIPMENT AND MODIFICATIONS

No changes were made in the experimental equipment with the exception of a modification in the water injection system. Tests indicate that the rate at which the water flows to produce steam may be too high.

VI. CONCLUSIONS

The following conclusions can be drawn from this work:

1. When the caking bituminous coals are used with diluents, only 20% Pittsburgh No. 8 coal can be added to the diluent while 40% Illinois No. 6 could be added due to the higher free swelling index of the Pittsburgh No. 8 (3 vs. 2).
2. When limestone is used as a diluent, considerably more sulfur is retained in the char than when using sand.
3. When the char from an experiment using limestone is recycled as the diluent for another experiment, the char continually retains additional sulfur through at least three recycles.
4. Decomposition of the limestone and reduction is indicated by the high concentrations of CO observed at 900°C.
5. Increasing the coal feed rate by a factor of 4 from 2.4 to 10.7 lb/hr at low H₂/Coal ratios (≈ 0.6) results in no appreciable change in gaseous HC yields (≈ 27%) or concentration (≈ 45%) but higher BTX yields (1.1% vs. 5.4%).

6. Although only one experiment was conducted, it appears that hydrogasification of untreated New Mexico sub-bituminous coal at 950°C does not give an increase in yield over hydrogasification at 900°C.
7. The hydrogasification of Wyodak lignite gives approximately the same gaseous HC yields as that obtained from North Dakota lignite but higher BTX yields particularly at 900°C and 1000 psi (9% vs. 2%).
8. Treating New Mexico sub-bituminous coal with NaCO₃ does not increase its hydrogasification qualities between 600°C and 900°C at 1000 psi but does decrease the BTX yield.

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Table 1

ULTIMATE ANALYSIS (WT PCT DRY) OF COALS
USED EXPERIMENTALLY

	Illinois No. 6	Pittsburgh No. 8	Wyodak
Carbon	63.07	51.0	59.3
Hydrogen	4.53	3.79	4.13
Oxygen ⁽¹⁾	15.05	6.69	25.62
Nitrogen	1.19	0.81	0.89
Sulfur	4.04	3.87	0.89
Ash	12.12	33.84	9.17

1) By Difference

Table 2

HYDROGASIFICATION OF ILLINOIS NO. 6 COAL

Run No.	285	311	316	326	327	328
Date	8/7/79	11/15/79	11/29/79	4/1/80	1/8/80	1/7/80
Coal Concentration-%	40	40	50	40	40	40
Diluent	Limestone	Limestone	Limestone	Limestone	Sand	Sand
Reactor Temperature (°C)	900	900	900	850	900	900
Reactor Pressure (psi)	1000	1000	1000	1000	1000	1000
Coal Feed Rate (lb/hr)	2.06	1.44	0.85	0.75	1.03	0.94
H ₂ Feed Rate (lb/hr)	0.73	1.13	0.98	1.07	1.04	1.07
H ₂ /Coal Weight Ratio	0.35	0.78	1.14	1.43	1.01	1.13
Residence Time (sec.)	5.4	4.5	4.8	4.6	4.6	4.6

Product Yields (% Carbon Converted)

CH ₄	36.0	32.4	41.8	25.8	27.3	30.3
C ₂ H ₆	0	1.8	0.9	6.2	0.7	0.8
Total Gaseous H.C.	36.0	34.2	42.7	32.0	28.0	31.1
BTX	8.0	12.7	9.3	8.1	9.3	9.8
Total H.C.	44.0	46.9	52.0	40.1	37.3	40.9
CO	15.2	15.2	5.3	4.1	2.9	3.3
CO ₂	1.9	1.6	0.3	0.2	0.1	0.1
Total	61.1	63.7	57.6	44.4	40.3	44.3
% Sulfur Retained in Char (1)		77	(1)	80	49	36.6

(1) Not Determined

Table 3

HYDROGASIFICATION OF ILLINOIS NO. 6 COAL

Run No.	311	320	323
Date	11/15/79	12/11/79	12/19/79
Coal Concentration-%	40	40	40
Diluent	Limestone	Char Run 311	Char Run 320
Reactor Temperature (°C)	900	900	900
Reactor Pressure (psi)	1000	1000	1000
Coal Feed Rate	1.44	0.97	0.63
H ₂ Feed Rate	1.13	0.90	1.01
H ₂ /Coal Weight Ratio	0.78	0.93	1.61
Residence Time (sec.)	4.5	4.9	4.7
<u>Product Yields (% Carbon Converted)</u>			
CH ₄	32.4	38.3	44.5
C ₂ H ₆	1.8	0.7	1.5
Total Gaseous H.C.	34.2	39.0	46.0
BTX	12.7	9.2	9.7
Total H.C.	46.9	48.2	55.7
CO	15.2	2.5	1.1
CO ₂	1.6	0.2	0
Total	63.7	50.9	56.8
% Sulfur Retained in Char	77.0	78.8	88.6

Table 4

HYDROGASIFICATION OF NEW MEXICO SUB-BITUMINOUS COAL
AT HIGH COAL FEED RATE AND LOW HYDROGEN TO COAL RATIO

Run No.	301	317
Date	10/4/79	12/4/79
Reactor Temperature (°C)	900	900
Reactor Pressure (psi)	1000	1000
Hydrogen Feed Rate (lb/hr)	0.147	0.632
Coal Feed Rate (lb/hr)	2.38	10.7
H ₂ /Coal Weight Ratio	0.062	0.059
Residence Time (sec)	7.7	5.7
<u>Product Yields (% Carbon Converted)</u>		
CH ₄	26.7	27.0
C ₂ H ₆	<u>0.1</u>	<u>0.1</u>
Total Gaseous H.C.	26.8	27.1
BTX	<u>1.1</u>	<u>5.4</u>
Total H.C.	27.9	32.5
CO	3.1	3.5
CO ₂	<u>0.8</u>	<u>1.1</u>
Total	31.8	37.1
Conc CH ₄ % By Vol.	42.8	45.4

Table 5
HYDROGASIFICATION OF WYODAK LIGNITE

Run No.	313	321	322
Date	11/21/79	12/13/79	12/18/79
Reactor Temperature (°C)	900	750	725
Reactor Pressure (psi)	1000	2000	2000
Hydrogen Feed Rate (lb/hr)	1.02	1.09	0.99
Coal Feed Rate (lb/hr)	0.84	1.11	0.73
H ₂ /Coal Weight Ratio	1.21	0.98	1.36
Residence Time (sec)	4.7	4.3	6.6
<u>Product Yields (% Carbon Converted)</u>			
CH ₄	45.5	20.4	13.8
C ₂ H ₆	1.2	11.8	9.8
Total Gaseous H.C.	46.7	32.2	23.6
BTX	9.0	10.0	11.4
> C ₉	0.0	2.4	1.8
Total Liquids	9.0	12.4	13.2
Total HC	55.7	44.6	36.8
CO	5.0	4.0	4.1
CO ₂	0.2	0.1	0.2
Total	60.9	48.7	41.1

Table 6
CHAR SULFUR RETENTION IN BITUMINOUS COAL EXPERIMENTS

Run No.	311	320	323	332	326	327	328
Date	11/15/79	12/11/79	12/19/79	1/17/80	1/4/80	1/8/80	1/9/8
		Char	Char	Char			
Diluent	Limestone	Run 311	Run 320	Run 323	Limestone	Sand	Sand
% Sulfur in Feed	1.7	3.11	4.2	4.9	1.7	1.5	1.6
% Sulfur in Char	2.48	4.89	5.4	6.42	2.05	0.88	0.76
% Sulfur Retained in Char	77	78.8	88.6	94	80	49	36.6

Figure 1. Hydrogasification of New Mexico Sub-Bituminous Coal, Fraction Carbon Converted to Gaseous HC (CH₄ and C₂H₆) vs. Temperature, Pressure-1000 to 2500 psi.

Figure 2. Hydrogasification of New Mexico Sub-Bituminous Coal Containing 10 wt% NaCO_3 , Fraction Carbon Converted vs. Temperature, Pressure-1000 psi.

APPENDIX

RUN NO. 299

SAMPLE NO.

DATE 10 -2 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.883	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.235	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.9253	LB/HR	COAL FED	1066.
HYDROGEN VELOCITY	.5335	FT/SEC	CHAR	540.0
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.
PREHEAT TEMP.	900.0	DEG C	BTX	0.
HYDROGEN PRESSURE	1000.	PSI	WATER	0.

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.90

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.0660	3.629	6.097
CARBON DIOXIDE	.6400E-01	.2683	.7081
METHANE	11.68	48.84	46.99
ETHYLENE	0.	0.	0.
ETHANE	.4200E-01	.3514	.3168
BENZENE	.1360	3.416	2.667
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		56.51	56.78

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	3.42	4.07	0.	0.	0.	2.67
HYDROCARBON GASES	49.2	234.	0.	0.	0.	47.3
CARBON OXIDES	3.90	0.	19.6	0.	0.	6.81
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.01
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	56.5	245.	19.6	100.	100.	99.7

HYDROGEN CONSUMPTION-	.6078E-01	LB HYDROGEN/LB COAL
	1.230	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.6066	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	56.51	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	80.09	PERCENT

RUN NO. 299

SAMPLE NO. 2

DATE 10 -2 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.664	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.235	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.6316	LB/HR	COAL FED	1066.
HYDROGEN VELOCITY	.3642	FT/SEC	CHAR	540.0
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.
PREHEAT TEMP.	900.0	DEG C	BTX	0.
HYDROGEN PRESSURE	1000.	PSI	WATER	0.

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.90

	PRODUCT CONC. IN GAS: MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	11.224	3.502	5.883
CARBON DIOXIDE	1.180	1.3376	1.8912
METHANE	15.69	44.78	43.09
ETHYLENE	0.	0.	0.
ETHANE	.3100E-01	1.770	1.596
BENZENE	1.280	2.195	1.714
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		51.00	51.74

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	2.19	2.61	0.	0.	0.	1.71
HYDROCARBON GASES	45.0	214.	0.	0.	0.	43.2
CARBON OXIDES	3.84	0.	19.6	0.	0.	6.77
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	51.0	224.	19.6	100.	100.	94.7

HYDROGEN CONSUMPTION-	.5184E-01	LB HYDROGEN/LB COAL
	1.049	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.5844	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	51.00	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	72.29	PERCENT

RUN NO. 299

SAMPLE NO. 3

DATE 10 -2 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 7.372 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.235	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.2059	LB/HR	COAL FED	1066.	GRAMS
HYDROGEN VELOCITY	.1187	FT/SEC	CHAR	540.0	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.90

	PRODUCT CONC. IN GAS: MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	2.516	2.346	3.942
CARBON DIOXIDE	.5680	.5298	1.398
METHANE	29.56	27.51	26.46
ETHYLENE	0.	0.	0.
ETHANE	.1190	.2215	.1998
BENZENE	.1620	.9056	.7071
TOLUENE	.1000E-02	.6521E-02	.5148E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		31.52	32.72

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	.912	1.09	0.	0.	0.	.712
HYDROCARBON GASES	27.7	132.	0.	0.	0.	26.7
CARBON OXIDES	2.88	0.	16.0	0.	0.	5.34
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	31.5	140.	16.0	100.	100.	75.6

HYDROGEN CONSUMPTION- .1687E-01 LB HYDROGEN/LB COAL
.3413 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -1.4841 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 31.52 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 44.10 PERCENT

RUN NO. 300 SAMPLE NO. 1 DATE 10 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 6.839 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	2.301	LB/HR	COAL FED	1148.	GRAMS
HYDROGEN FLOW RATE	.3158	LB/HR	CHAR	583.0	GRAMS
HYDROGEN VELOCITY	.1821	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.81

	PRODUCT CONC. IN GAS: MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	3.085	4.286	7.200
CARBON DIOXIDE	.4090	.5683	1.500
METHANE	29.21	40.49	38.96
ETHYLENE	0.	0.	0.
ETHANE	.4900E-01	.1359	.1225
BENZENE	.1920	.1599	.1248
TOLUENE	.1000E-02	.9714E-02	.7669E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		47.09	49.04

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	1.61	1.92	0.	0.	0.	1.26
HYDROCARBON GASES	40.6	193.	0.	0.	0.	39.1
CARBON OXIDES	4.85	0.	25.5	0.	0.	8.70
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.2
TOTAL	47.1	203.	25.5	100.	100.	92.1

HYDROGEN CONSUMPTION- .4294E-01 LB HYDROGEN/LB COAL
.8688 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -1.5413 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 47.09 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 64.93 PERCENT

RUN NO. 300 SAMPLE NO. 2 DATE 10 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 7.651 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	2.301	LB/HR	COAL FED	1148.	GRAMS
HYDROGEN FLOW RATE	.1544	LB/HR	CHAR	583.0	GRAMS
HYDROGEN VELOCITY	.8904E-01	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS-%	CHAR ANALYSIS-%
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.81

	PRODUCT CONC. IN GAS- MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	4.840	3.288	5.524
CARBON DIOXIDE	1.294	.8792	2.321
NITRIC ACID	41.79	28.33	27.25
ETHYLENE	0.	0.	0.
ETHANE	.4700E-01	.6374E-01	.5747E-01
BENZENE	.1440	.5864	.4578
TOLUENE	.1000E-02	.4750E-02	.3750E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		33.15	35.62

TOTAL MATERIAL BALANCE-%

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	.591	.704	0.	0.	0.	.462
HYDROCARBON GASES	20.4	130.	0.	0.	0.	27.3
CARBON OXIDES	4.17	0.	23.7	0.	0.	7.84
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.2
TOTAL	23.1	140.	23.7	100.	100.	78.7

HYDROGEN CONSUMPTION- .1811E-01 LB HYDROGEN/LB COAL
.3665 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -1.4723 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 33.15 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 44.84 PERCENT

RUN NO. 300

SAMPLE NO. 3

DATE 10 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.904	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.301	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	1.1108	LB/HR	COAL FED	1148. GRAMS
HYDROGEN VELOCITY	1.6391E-01	FT/SEC	CHAR	583.0 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0. GRAMS

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	1.8100	0.
ASH	17.68	34.81

	PRODUCT CONC. IN GAS: MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	7.255	3.538	5.943
CARBON DIOXIDE	1.808	.8817	2.327
METHANE	43.47	21.15	20.35
ETHYLENE	0.	0.	0.
ETHANE	1.4000E-01	1.3894E-01	1.3511E-01
BENZENE	1.7000E-02	1.2046E-01	1.1597E-01
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	25.63	28.67
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TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	1.205E-01	1.244E-01	0.	0.	0.	1.160E-01
HYDROCARBON GASES	21.2	101.	0.	0.	0.	20.4
CARBON OXIDES	4.42	0.	24.9	0.	0.	8.27
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	40.2
TOTAL	25.6	100.	24.9	100.	100.	71.7

HYDROGEN CONSUMPTION-	1.3507E-02	LB HYDROGEN/LB COAL
	1.7096E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.4194	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	25.63	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	33.05	PERCENT

RUN NO. 301

SAMPLE NO. 1

DATE 10 -4 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.797	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	2.380	LB/HR	COAL FED	976.7 GRAMS
HYDROGEN FLOW RATE	.3253	LB/HR	CHAR	554.3 GRAMS
HYDROGEN VELOCITY	.1875	FT/SEC	LIGHT OILS	0. GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI		

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	31.15

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	3.134	4.335	7.283
CARBON DIOXIDE	0.	0.	0.
METHANE	28.42	39.22	37.74
ETHYLENE	0.	0.	0.
ETHANE	.6500E-01	.1795	.1618
BENZENE	.2980	2.471	1.929
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	18.28
TOTAL		46.21	65.39

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.47	2.94	0.	0.	0.	1.93
HYDROCARBON GASES	39.4	187.	0.	0.	0.	37.9
CARBON OXIDES	4.34	0.	20.4	0.	0.	7.28
WATER	0.	40.0	79.6	0.	0.	18.3
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	47.5
TOTAL	46.2	238.	100.	100.	100.	116.

HYDROGEN CONSUMPTION-	.5763E-01	LB HYDROGEN/LB COAL
	1.166	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.5326 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	46.21	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	63.91	PERCENT

RUN NO. 301 SAMPLE NO. 2 DATE 10 -4 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 7.694 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	2.380	LB/HR	COAL FED	976.7	GRAMS
HYDROGEN FLOW RATE	.1468	LB/HR	CHAR	554.3	GRAMS
HYDROGEN VELOCITY	.8467E-01	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	31.15

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	4.980	3.110	5.225
CARBON DIOXIDE	1.270	.7932	2.094
METHANE	42.80	26.67	25.66
ETHYLENE	0.	0.	0.
ETHANE	.6000E-01	.7480E-01	.6744E-01
BENZENE	.2800	1.048	.8183
TOLUENE	.2400E-02	.1048E-01	.8273E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	17.89
TOTAL		31.70	51.76

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.06	1.26	0.	0.	0.	.827
HYDROCARBON GASES	26.7	127.	0.	0.	0.	25.7
CARBON OXIDES	3.90	0.	22.1	0.	0.	7.32
WATER	0.	39.1	77.9	0.	0.	17.9
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	47.5
TOTAL	31.7	175.	100.	100.	100.	102.

HYDROGEN CONSUMPTION- .3142E-01 LB HYDROGEN/LB COAL
.6358 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4619 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 31.70 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 42.74 PERCENT

RUN NO. 301

SAMPLE NO. 3

DATE 10 -4 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.812	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.380	LB/HR	COAL FED	976.7	GRAMS
HYDROGEN FLOW RATE	.1263	LB/HR	CHAR	554.3	GRAMS
HYDROGEN VELOCITY	.7283E-01	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	31.15

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV TO PRODUCT
CARBON MONOXIDE	5.010	2.691	4.521
CARBON DIOXIDE	1.733	.9310	2.458
METHANE	46.21	24.77	23.83
ETHYLENE	0.	0.	0.
ETHANE	.6300E-01	.6756E-01	.6092E-01
BENZENE	.2340	.7534	.5883
TOLUENE	.2400E-02	.9015E-02	.7116E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	29.22	31.47
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.762	.909	0.	0.	0.	.595
HYDROCARBON GASES	24.8	118.	0.	0.	0.	23.9
CARBON DIOXIDES	3.62	0.	21.4	0.	0.	6.98
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	47.5

TOTAL	29.2	127.	21.4	100.	100.	81.8
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HYDROGEN CONSUMPTION-	.1112E-01	LB HYDROGEN/LB COAL
	.2250	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4553	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	29.22	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	39.47	PERCENT

RUN NO. 301

SAMPLE NO. 4

DATE 10 -4 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	8.002	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.380	LB/HR	COAL FED	976.7	GRAMS
HYDROGEN FLOW RATE	.9474E-01	LB/HR	CHAR	554.3	GRAMS
HYDROGEN VELOCITY	.5462E-01	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	31.15

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	5.030	2.027	3.405
CARBON DIOXIDE	1.856	.7478	1.974
METHANE	47.42	19.06	18.34
ETHYLENE	0.	0.	0.
ETHANE	.6300E-01	.5067E-01	.4569E-01
BENZENE	.2340	.5651	.4412
TOLUENE	.2400E-02	.6761E-02	.5337E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	22.46	24.21
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.572	.682	0.	0.	0.	.447
HYDROCARBON GASES	19.1	90.9	0.	0.	0.	18.4
CARBON OXIDES	2.77	0.	16.6	0.	0.	5.38
W						
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	47.5

TOTAL	22.5	99.1	16.6	100.	100.	74.5
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HYDROGEN CONSUMPTION-	-.3565E-03	LB HYDROGEN/LB COAL
	-.7214E-02	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4279	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	22.46	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	30.36	PERCENT

RUN NO. 302

SAMPLE NO. 1

DATE 10 -9 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	9.204	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.613	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.7642	LB/HR	COAL FED	903.5 GRAMS
HYDROGEN VELOCITY	.4406	FT/SEC	CHAR	451.7 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0. GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	35.36

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6800	3.261	5.478
CARBON DIOXIDE	.4940E-01	.2369	.6253
METHANE	8.635	41.31	39.75
ETHYLENE	0.	0.	0.
ETHANE	.4400E-01	.4212	.3798
BENZENE	.1850	5.317	4.151
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	50.55	50.38
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.32	6.33	0.	0.	0.	4.15
HYDROCARBON GASES	41.7	198.	0.	0.	0.	40.1
CARBON DIOXIDE	3.50	0.	17.6	0.	0.	6.10
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.3

TOTAL	50.5	212.	17.6	100.	100.	92.5
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HYDROGEN CONSUMPTION-	.4684E-01	LB HYDROGEN/LB COAL
	.9479	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5499	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	50.55	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	70.38	PERCENT

RUN NO. 302

SAMPLE NO. 2

DATE 10 -9 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE-TIME-MEASURED	0.	SECONDS
CALCULATED	11.52	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.613	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.5368	LB/HR	COAL FED	903.5	GRAMS
HYDROGEN VELOCITY	.3095	FT/SEC	CHAR	451.7	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	59.30	
HYDROGEN	4.180	
OXYGEN	16.80	
NITROGEN	1.230	
SULFUR	.8100	
ASH	17.68	

PRODUCT CONC. IN	% CARBON CONV.	% MAF COAL CONV.
GAS, MOLE %	TO PRODUCT	TO PRODUCT

CARBON MONOXIDE	.9000	3.032	5.093
CARBON DIOXIDE	.6700E-01	.2257	.5958
METHANE	12.12	40.75	39.20
ETHYLENE	0.	0.	0.
ETHANE	.3650E-01	.2454	.2213
BENZENE	.1620	3.271	2.554
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	47.52	47.67
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.27	3.89	0.	0.	0.	2.55
HYDROCARBON GASES	41.0	195.	0.	0.	0.	39.4
CARBON OXIDES	3.26	0.	16.4	0.	0.	5.69
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.3
TOTAL	47.5	206.	16.4	100.	100.	89.8

HYDROGEN CONSUMPTION-	.4444E-01	LB HYDROGEN/LB COAL
	.8992	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5592	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	47.52	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	67.18	PERCENT

RUN NO. 302

SAMPLE NO. 3

DATE 10 -9 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	15.25	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.613	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.3158	LB/HR	COAL FED	903.5	GRAMS
HYDROGEN VELOCITY	.1821	FT/SEC	CHAR	451.7	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	59.30		0.
HYDROGEN	4.180		0.
OXYGEN	16.80		0.
NITROGEN	1.230		0.
SULFUR	.8100		0.
ASH	17.68		35.36

PRODUCT CONC. IN	% CARBON CONV.	% MAF COAL CONV.
GAS, MOLE %	TO PRODUCT	TO PRODUCT

CARBON MONOXIDE	1.570	3.111	5.226
CARBON DIOXIDE	.1900	.3765	.9939
METHANE	19.96	39.46	37.97
ETHYLENE	0.	0.	0.
ETHANE	.3430E-01	.1357	.1223
BENZENE	.1710	2.031	1.586
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	45.11	45.89
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.03	2.42	0.	0.	0.	1.59
HYDROCARBON GASES	39.6	100.	0.	0.	0.	38.1
CARBON OXIDES	3.49	0.	18.2	0.	0.	6.22
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.3

TOTAL	45.1	198.	18.2	100.	100.	88.0
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HYDROGEN CONSUMPTION-	.4110E-01	LB HYDROGEN/LB COAL
	.8316	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5530	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	45.11	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	63.77	PERCENT

RUN NO. 302

SAMPLE NO. 4

DATE 10 -9 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	18.72	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.613	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.1895	LB/HR	COAL FED	903.5 GRAMS
HYDROGEN VELOCITY	.1092	FT/SEC	CHAR	451.7 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0. GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	35.36

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	2.101	2.498	4.196
CARBON DIOXIDE	.3990	.4744	1.252
METHANE	25.93	30.76	29.59
ETHYLENE	0.	0.	0.
ETHANE	.3770E-01	.8947E-01	.8067E-01
BENZENE	.1980	1.411	1.102
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	35.23	36.22
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.41	1.68	0.	0.	0.	1.10
HYDROCARBON GASES	30.8	147.	0.	0.	0.	29.7
CARBON OXIDES	2.97	0.	16.2	0.	0.	5.45
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.3
TOTAL	35.2	156.	16.2	100.	100.	78.3

HYDROGEN CONSUMPTION-	.2340E-01	LB HYDROGEN/LB COAL
	.4735	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5026	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	35.23	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	49.51	PERCENT

RUN NO. 305

SAMPLE NO. 1

DATE 10 -31 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.635	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.215	LB/HR	COAL FED	1123.	GRAMS
HYDROGEN FLOW RATE	.6411	LB/HR	CHAR	558.4	GRAMS
HYDROGEN VELOCITY	.3696	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

COAL ANALYSIS, %

CARBON	59.30
HYDROGEN	4.180
OXYGEN	16.80
NITROGEN	1.230
SULFUR	.8100
ASH	17.68

CHAR ANALYSIS, %

0.
0.
0.
0.
0.
35.54

PRODUCT CONC. IN
GAS, MOLE %% CARBON CONV.
TO PRODUCT% MAF COAL CONV.
TO PRODUCT

CARBON MONOXIDE	1.380	4.043	6.792
CARBON DIOXIDE	.9900E-01	.2901	.7657
METHANE	14.80	43.26	41.62
ETHYLENE	0.	0.	0.
ETHANE	.6500E-01	.3801	.3428
BENZENE	.2600	4.566	3.565
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL

52.54

53.09

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.57	5.43	0.	0.	0.	3.56
HYDROCARBON GASES	43.6	207.	0.	0.	0.	48.0
CARBON OXIDES	4.33	0.	21.7	0.	0.	7.56
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.0

TOTAL	52.5	220.	21.7	100.	100.	94.9
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HYDROGEN CONSUMPTION-	.5029E-01	LB HYDROGEN/LB COAL
	1.010	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.5540	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	52.54	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	72.60	PERCENT

RUN NO. 305

SAMPLE NO. 2

DATE 10 -31 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.513	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.215	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.6411	LB/HR	COAL FED	1123. GRAMS
HYDROGEN VELOCITY	.3696	FT/SEC	CHAR	558.4 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0. GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	59.30	
HYDROGEN	4.180	
OXYGEN	16.80	
NITROGEN	1.230	
SULFUR	.8100	
ASH	17.68	

PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
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CARBON MONOXIDE	1.380	4.043	6.792
CARBON DIOXIDE	.5000E-01	.1465	.3867
METHANE	14.20	41.51	39.94
ETHYLENE	0.	0.	0.
ETHANE	.6000E-01	.3509	.3164
BENZENE	.2100	3.688	2.879
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	49.74	50.31
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.69	4.39	0.	0.	0.	2.88
HYDROCARBON GASES	41.9	199.	0.	0.	0.	40.3
CARBON OXIDES	4.19	0.	20.4	0.	0.	7.18
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.0
TOTAL	49.7	211.	20.4	100.	100.	92.1

HYDROGEN CONSUMPTION-	.4632E-01	LB HYDROGEN/LB COAL
	.9373	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.5470 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	49.74	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	68.94	PERCENT

RUN NO. 306

SAMPLE NO. 1

DATE 11 -1 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.182	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.716	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.2432	LB/HR	COAL FED	921.6	GRAMS
HYDROGEN VELOCITY	.1402	FT/SEC	CHAR	536.9	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	30.35

PRODUCT CONC. IN	% CARBON CONV.	% MAF COAL CONV.
GAS, MOLE %	TO PRODUCT	TO PRODUCT

CARBON MONOXIDE	4.220	6.052	10.17
CARBON DIOXIDE	.7200	1.033	2.726
METHANE	37.50	53.65	51.62
ETHYLENE	0.	0.	0.
ETHANE	.7400E-01	.2118	.1910
BENZENE	.4700	4.040	3.154
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.20

TOTAL	64.99	82.06
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.04	4.81	0.	0.	0.	3.15
HYDROCARBON GASES	53.9	256.	0.	0.	0.	51.8
CARBON OXIDES	7.08	0.	38.2	0.	0.	12.9
WATER	0.	31.1	61.8	0.	0.	14.2
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	49.3

TOTAL	65.0	300.	100.	100.	100.	134.
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HYDROGEN CONSUMPTION-	.8345E-01	LB HYDROGEN/LB COAL
	1.689	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5907	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.93	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	79.83	PERCENT

RUN NO. 306

SAMPLE NO. 2

DATE 11 -1 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 9.514 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.716	LB/HR	COAL FED	921.6	GRAMS
HYDROGEN FLOW RATE	.2526	LB/HR	CHAR	536.9	GRAMS
HYDROGEN VELOCITY	.1457	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	30.35

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	4.000	5.960	10.01
CARBON DIOXIDE	.3700	.5513	1.455
METHANE	33.50	49.80	47.91
ETHYLENE	0.	0.	0.
ETHANE	.9500E-01	.2825	.2548
BENZENE	.3000	2.679	2.092
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.33
TOTAL		59.27	77.06

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.68	3.19	0.	0.	0.	2.09
HYDROCARBON GASES	50.1	238.	0.	0.	0.	48.2
CARBON OXIDES	6.51	0.	33.2	0.	0.	11.5
WATER	0.	33.6	66.8	0.	0.	15.3
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	49.3
TOTAL	59.3	282.	100.	100.	100.	129.

HYDROGEN CONSUMPTION- .7624E-01 LB HYDROGEN/LB COAL
1.543 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -1.5759 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 57.02 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 78.77 PERCENT

RUN NO. 306 SAMPLE NO. 3 DATE 11 -1 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS After coal traps

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 9.618 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.716	LB/HR	COAL FED	921.6	GRAMS
HYDROGEN FLOW RATE	.2368	LB/HR	CHAR	536.9	GRAMS
HYDROGEN VELOCITY	.1366	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	30.35

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	4.240	5.922	9.949
CARBON DIOXIDE	.2900	.4051	1.069
METHANE	35.20	49.06	47.20
ETHYLENE	0.	0.	0.
ETHANE	.7700E-01	.2147	.1936
BENZENE	.3100E-01	.2595	.2026
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.69
TOTAL		55.86	74.30

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.260	.309	0.	0.	0.	.203
HYDROCARBON GASES	49.3	234.	0.	0.	0.	47.4
CARBON OXIDES	6.33	0.	31.7	0.	0.	11.0
WATER	0.	34.3	68.3	0.	0.	15.7
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	49.3

TOTAL	55.9	277.	100.	100.	100.	126.
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HYDROGEN CONSUMPTION-	.7378E-01	LB HYDROGEN/LB COAL
	1.493	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.5841 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	55.86	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	77.03	PERCENT

RUN NO. 307

SAMPLE NO. 1

DATE 11 -6 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.627	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.823	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.3000	LB/HR	COAL FED	939.2	GRAMS
HYDROGEN VELOCITY	.1803	FT/SEC	CHAR	493.6	GRAMS
REACTOR TEMP.	950.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	33.64

PRODUCT CONC. IN	% CARBON CONV.	% MAF COAL CONV.
GAS, MOLE. %	TO PRODUCT	TO PRODUCT

CARBON MONOXIDE	3.600	3.872	6.505
CARBON DIOXIDE	.7500	.8068	2.130
METHANE	36.60	39.28	37.79
ETHYLENE	0.	0.	0.
ETHANE	.3710E-01	.7966E-01	.7183E-01
BENZENE	.2260	1.457	1.138
TOLUENE	.1000E-02	.7521E-02	.5937E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	17.04

TOTAL	45.50	64.68
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.46	1.74	0.	0.	0.	1.14
HYDROCARBON GASES	30.4	187.	0.	0.	0.	37.9
CARBON OXIDES	4.68	0.	25.8	0.	0.	8.63
WATER	0.	37.3	74.2	0.	0.	17.0
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	42.4

TOTAL	45.5	234.	100.	100.	100.	110.
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HYDROGEN CONSUMPTION-	.5595E-01	LB HYDROGEN/LB COAL
	1.132	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5291	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	45.50	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	62.83	PERCENT

RUN NO. 307

SAMPLE NO. 2

DATE 11 -6 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.940	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	2.823	LB/HR	COAL FED	939.2	GRAMS
HYDROGEN FLOW RATE	.3000	LB/HR	CHAR	493.6	GRAMS
HYDROGEN VELOCITY	.1803	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	950.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	33.64

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	4.220	4.539	7.626
CARBON DIOXIDE	.6790	.7304	1.928
METHANE	38.42	41.23	39.67
ETHYLENE	0.	0.	0.
ETHANE	.3170E-01	.6807E-01	.6137E-01
BENZENE	.1370	.8833	.6896
TOLUENE	.1000E-02	.7521E-02	.5937E-02
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	16.48
TOTAL		47.46	66.46

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.891	1.06	0.	0.	0.	.696
HYDROCARBON GASES	41.3	197.	0.	0.	0.	39.7
CARBON OXIDES	5.27	0.	28.2	0.	0.	9.55
WATER	0.	36.1	71.8	0.	0.	16.5
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	42.4
TOTAL	47.5	241.	100.	100.	100.	112.

HYDROGEN CONSUMPTION-	.5903E-01	LB HYDROGEN/LB COAL
	1.195	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.5357	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	47.46	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	65.27	PERCENT

RUN NO. 308

SAMPLE NO. 1

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.731 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.156	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.4960	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	600.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	600.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	29.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.8000E-01	.7733	1.314
CARBON DIOXIDE	.2600	2.513	6.709
METHANE	.1670	1.611	1.567
ETHYLENE	0.	0.	0.
ETHANE	.5700E-01	1.100	1.003
BENZENE	.1500E-01	.8691	.6861
TOLUENE	.3000E-02	.2028	.1619
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.78
TOTAL		7.069	26.22

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.07	1.24	0.	0.	0.	.848
HYDROCARBON GASES	2.71	11.0	0.	0.	0.	2.57
CARBON OXIDES	3.29	0.	30.0	0.	0.	8.02
WATER	0.	30.2	70.0	0.	0.	14.8
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.0
TOTAL	7.07	50.4	100.	100.	100.	84.1

HYDROGEN CONSUMPTION- -.1996E-01 LB HYDROGEN/LB COAL
-.4443 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2827 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 7.069 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 4.425 PERCENT

RUN NO. 308

SAMPLE NO. 2

DATE 11 -7 - 1979

COAL TYPE- NA2 CD3 TREATED NEW MEXICO SUB BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.726	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.140	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5060	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	630.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	630.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1420	1.354	2.300
CARBON DIOXIDE	.2600	2.479	6.617
METHANE	.3300	3.139	3.054
ETHYLENE	0.	0.	0.
ETHANE	.1300	2.474	2.256
BENZENE	.1330E-01	.7600	.6000
TOLUENE	.4000E-02	.2667	.2129
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.23
TOTAL		10.47	29.27

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.03	1.20	0.	0.	0.	.813
HYDROCARBON GASES	5.61	22.5	0.	0.	0.	5.31
CARBON OXIDES	3.83	0.	32.6	0.	0.	8.92
WATER	0.	29.1	67.4	0.	0.	14.2
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	10.5	60.7	100.	100.	100.	87.1

HYDROGEN CONSUMPTION-	-.1580E-01	LB HYDROGEN/LB COAL
	-.3518	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.2828	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	10.47	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	8.162	PERCENT

RUN NO. 308

SAMPLE NO. 3

DATE 11 -7 - 1979

COAL TYPE- NA2 C03 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.711	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.127	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5198	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	665.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	665.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	53.90	
HYDROGEN	4.020	
OXYGEN	13.89	
NITROGEN	1.230	
SULFUR	.8800	
ASH	26.00	39.16

PRODUCT CONC. IN	% CARBON CONV.	% MAF COAL CONV.
GAS, MOLE %	TO PRODUCT	TO PRODUCT

CARBON MONOXIDE	.3200	3.017	5.125
CARBON DIOXIDE	.2300	2.169	5.789
METHANE	.8500	7.996	7.779
ETHYLENE	0.	0.	0.
ETHANE	.3160	5.948	5.423
BENZENE	.1220E-01	.6895	.5443
TOLUENE	.1100E-01	.7252	.5789
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	13.09

TOTAL	20.54	38.33
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.41	1.71	0.	0.	0.	1.12
HYDROCARBON GASES	13.9	56.1	0.	0.	0.	13.2
CARBON OXIDES	5.19	0.	38.0	0.	0.	10.9
WATER	0.	26.8	62.0	0.	0.	13.1
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.24
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	20.5	92.5	100.	100.	100.	96.2

HYDROGEN CONSUMPTION-	-.3032E-02	LB HYDROGEN/LB COAL
	-.6750E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.2940	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	20.54	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	19.20	PERCENT

RUN NO. 308

SAMPLE NO. 4

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.701	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5425	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	700.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	700.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4900	4.465	7.584
CARBON DIOXIDE	.4000E-01	.3645	.9729
METHANE	1.140	10.36	10.08
ETHYLENE	0.	0.	0.
ETHANE	.4000	7.275	6.633
BENZENE	.1900E-01	1.038	.8192
TOLUENE	.1200E-01	.7645	.6103
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.45
TOTAL		24.27	42.15

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.80	2.15	0.	0.	0.	1.43
HYDROCARBON GASES	17.6	71.2	0.	0.	0.	16.7
CARBON OXIDES	4.83	0.	26.8	0.	0.	8.56
WATER	0.	31.6	73.2	0.	0.	15.4
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	24.3	113.	100.	100.	100.	100.

HYDROGEN CONSUMPTION-	.5171E-02	LB HYDROGEN/LB COAL
	.1151	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.2946	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	24.27	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	24.50	PERCENT

RUN NO. 308

SAMPLE NO. 5

DATE 11 -7 - 1979

COAL TYPE- NA2 C03 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.701	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.089	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5425	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	730.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	730.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5400	4.920	8.358
CARBON DIOXIDE	.3100E-01	.2825	.7540
METHANE	1.510	13.73	13.35
ETHYLENE	0.	0.	0.
ETHANE	.6950	12.64	11.53
BENZENE	.2900E-01	1.584	1.250
TOLUENE	.1700E-01	1.083	.8645
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.13
TOTAL		34.24	51.24

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.67	3.17	0.	0.	0.	2.11
HYDROCARBON GASES	26.4	104.	0.	0.	0.	24.9
CARBON OXIDES	5.20	0.	28.4	0.	0.	9.11
WATER	0.	30.9	71.6	0.	0.	15.1
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	34.2	146.	100.	100.	100.	109.

HYDROGEN CONSUMPTION-	.1869E-01	LB HYDROGEN/LB COAL
	.4160	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3200	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	34.24	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	36.30	PERCENT

RUN NO. 308

SAMPLE NO. 6

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.701	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5425	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	760.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	760.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5800	5.285	8.977
CARBON DIOXIDE	.2500E-01	.2278	.6080
METHANE	1.880	17.09	16.63
ETHYLENE	0.	0.	0.
ETHANE	.6400	11.64	10.61
BENZENE	.7000E-01	3.823	3.018
TOLUENE	.1200E-01	.7645	.6103
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.85
TOTAL		38.83	55.30

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.59	5.28	0.	0.	0.	3.63
HYDROCARBON GASES	28.7	116.	0.	0.	0.	27.2
CARBON OXIDES	5.51	0.	29.7	0.	0.	9.59
WATER	0.	30.4	70.3	0.	0.	14.9
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	38.8	160.	100.	100.	100.	113.

HYDROGEN CONSUMPTION-	.2403E-01	LB HYDROGEN/LB COAL
	.5351	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3254	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	38.83	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	41.92	PERCENT

RUN NO. 308

SAMPLE NO. 7

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.701	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5425	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	780.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	780.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6130	5.585	9.488
CARBON DIOXIDE	.2400E-01	.2187	.5837
METHANE	2.150	19.55	19.02
ETHYLENE	0.	0.	0.
ETHANE	.6180	11.24	10.25
BENZENE	.9100E-01	4.970	3.924
TOLUENE	.6000E-02	.3823	.3051
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.54
TOTAL		41.94	58.11

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.35	6.08	0.	0.	0.	4.23
HYDROCARBON GASES	30.8	126.	0.	0.	0.	29.3
CARBON OXIDES	5.80	0.	31.1	0.	0.	10.1
WATER	0.	29.7	68.9	0.	0.	14.5
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	41.9	170.	100.	100.	100.	116.

HYDROGEN CONSUMPTION-	.2800E-01	LB HYDROGEN/LB COAL
	.6233	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3310	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	41.94	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	45.97	PERCENT

RUN NO. 308

SAMPLE NO. 8

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.657	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.064	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5770	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	800.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	800.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6250	5.563	9.449
CARBON DIOXIDE	.2450E-01	.2181	.5821
METHANE	2.620	23.27	22.63
ETHYLENE	0.	0.	0.
ETHANE	.6360	11.30	10.30
BENZENE	.1500	8.002	6.317
TOLUENE	.4000E-02	.2489	.1987
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.57
TOTAL		48.60	64.05

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.25	9.32	0.	0.	0.	6.52
HYDROCARBON GASES	34.6	143.	0.	0.	0.	32.9
CARBON OXIDES	5.78	0.	31.0	0.	0.	10.0
WATER	0.	29.8	69.0	0.	0.	14.6
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	48.6	190.	100.	100.	100.	122.

HYDROGEN CONSUMPTION-	.3613E-01	LB HYDROGEN/LB COAL
	.8044	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3290	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	48.60	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	54.12	PERCENT

RUN NO. 308

SAMPLE NO. 9

DATE 11 -7 - 1979

COAL TYPE- NA2 C03 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.657	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.064	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5770	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	820.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	820.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAE COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6370	5.670	9.631
CARBON DIOXIDE	.2500E-01	.2225	.5939
METHANE	2.710	24.07	23.41
ETHYLENE	0.	0.	0.
ETHANE	.5470	9.718	8.861
BENZENE	.9500E-01	5.068	4.001
TOLUENE	.1100E 01	.6846	.5464
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.44
TOTAL		45.43	61.49

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAE COAL
LIQUIDS	5.75	6.58	0.	0.	0.	4.55
HYDROCARBON GASES	33.8	141.	0.	0.	0.	32.3
CARBON OXIDES	5.89	0.	31.6	0.	0.	10.2
WATER	0.	29.5	68.4	0.	0.	14.4
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	45.4	185.	100.	100.	100.	119.

HYDROGEN CONSUMPTION-	.3423E-01	LB HYDROGEN/LB COAL
	.7620	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3413	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	45.43	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	50.62	PERCENT

RUN NO. 308

SAMPLE NO. 10

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.657	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.064	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5770	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	840.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	840.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1600.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6530	5.812	9.872
CARBON DIOXIDE	.2600E-01	.2314	.6177
METHANE	3.270	29.04	28.25
ETHYLENE	0.	0.	0.
ETHANE	.4680	8.315	7.581
BENZENE	.1410	7.522	5.938
TOLUENE	.2000E-02	.1245	.9935E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.27
TOTAL		51.04	66.63

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.65	8.62	0.	0.	0.	6.04
HYDROCARBON GASES	37.4	159.	0.	0.	0.	35.8
CARBON OXIDES	6.04	0.	32.4	0.	0.	10.5
WATER	0.	29.2	67.6	0.	0.	14.3
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	51.0	204.	100.	100.	100.	125.

HYDROGEN CONSUMPTION-	.4200E-01	LB HYDROGEN/LB COAL
	.9350	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3573	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	51.04	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	58.23	PERCENT

RUN NO. 308

SAMPLE NO. 11

DATE 11 -7 - 1979

COAL TYPE- NA2 C03 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.657 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.064	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5770	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	855.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	855.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6680	5.945	10.10
CARBON DIOXIDE	.2300E-01	.2047	.5464
METHANE	3.930	34.90	33.95
ETHYLENE	0.	0.	0.
ETHANE	.3640	6.467	5.896
BENZENE	.1470	7.842	6.191
TOLUENE	.1000E-02	.6223E-01	.4968E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.18

TOTAL	55.42	70.91
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.90	8.90	0.	0.	0.	6.24
HYDROCARBON GASES	41.4	179.	0.	0.	0.	39.8
CARBON OXIDES	6.15	0.	32.8	0.	0.	10.6
WATER	0.	29.0	67.2	0.	0.	14.2
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6

TOTAL	55.4	225.	100.	100.	100.	129.
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HYDROGEN CONSUMPTION-	.5013E-01	LB HYDROGEN/LB COAL
	1.116	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3876 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	55.42	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	64.58	PERCENT

RUN NO. 308

SAMPLE NO. 12

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.645	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.042	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN VELOCITY	.5932	FT/SEC	CHAR	909.0	GRAMS
REACTOR TEMP.	865.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	865.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6530	5.691	9.667
CARBON DIOXIDE	.2400E-01	.2092	.5583
METHANE	4.450	38.70	37.65
ETHYLENE	0.	0.	0.
ETHANE	.2720	4.732	4.314
BENZENE	.1540	8.045	6.351
TOLUENE	.1000E-02	.6094E-01	.4864E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.45
TOTAL		57.43	73.03

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.11	9.43	0.	0.	0.	6.40
HYDROCARBON GASES	43.4	190.7	0.	0.	0.	42.0
CARBON OXIDES	5.90	0.	31.6	0.	0.	10.2
WATER	0.	29.5	68.4	0.	0.	14.4
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	57.4	237.	100.	100.	100.	131.

HYDROGEN CONSUMPTION-	.5496E-01	LB HYDROGEN/LB COAL
	1.224	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4024 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	57.43	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	68.04	PERCENT

RUN NO. 308

SAMPLE NO. 13

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.645	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5932	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	875.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	875.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	30.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6090	5.308	9.016
CARBON DIOXIDE	.2300E-01	.2005	.5351
METHANE	4.810	41.83	40.09
ETHYLENE	0.	0.	0.
ETHANE	.1900	3.306	3.014
BENZENE	.1510	7.888	6.227
TOLUENE	.1000E-02	.6094E-01	.4864E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.89
TOTAL		58.59	74.42

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.95	8.95	0.	0.	0.	6.28
HYDROCARBON GASES	45.1	199.	0.	0.	0.	43.7
CARBON OXIDES	5.51	0.	29.5	0.	0.	9.55
WATER	0.	30.4	70.5	0.	0.	14.9
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.0
TOTAL	58.6	247.	100.	100.	100.	132.

HYDROGEN CONSUMPTION-	.5898E-01	LB HYDROGEN/LB COAL
	1.313	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4258	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	57.68	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	69.49	PERCENT

RUN NO. 308

SAMPLE NO. 14

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.645	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5932	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	885.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	885.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5870	5.116	8.690
CARBON DIOXIDE	.2400E-01	.2092	.5583
METHANE	5.200	45.22	43.99
ETHYLENE	0.	0.	0.
ETHANE	.1220	2.123	1.935
BENZENE	.1520	7.940	6.269
TOLUENE	.1000E-02	.6094E-01	.4864E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.08
TOTAL		60.67	76.57

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.00	9.01	0.	0.	0.	6.32
HYDROCARBON GASES	47.3	211.	0.	0.	0.	45.9
CARBON OXIDES	5.33	0.	28.6	0.	0.	9.25
WATER	0.	30.8	71.4	0.	0.	15.1
AMMONIA	0.	6.56	0.	100.	0.	0.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	60.7	258.	100.	100.	100.	134.

HYDROGEN CONSUMPTION-	.6369E-01	LB HYDROGEN/LB COAL
	1.418	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4476	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.11	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	70.88	PERCENT

RUN NO. 308

SAMPLE NO. 15

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.645	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5932	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	892.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	892.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5730	4.994	8.483
CARBON DIOXIDE	.2700E-01	.2353	.6281
METHANE	5.300	46.09	44.84
ETHYLENE	0.	0.	0.
ETHANE	.9800E-01	1.705	1.554
BENZENE	.1430	7.470	5.898
TOLUENE	.1000E-02	.6094E-01	.4864E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.15

TOTAL	60.55	76.60
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.53	8.48	0.	0.	0.	5.95
HYDROCARBON GASES	47.8	213.	0.	0.	0.	46.4
CARBON OXIDES	5.23	0.	28.2	0.	0.	9.11
WATER	0.	31.0	71.8	0.	0.	15.2
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6

TOTAL	60.6	261.	100.	100.	100.	134.
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HYDROGEN CONSUMPTION-	.6454E-01	LB HYDROGEN/LB COAL
	1.437	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4559	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.08	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	71.27	PERCENT

RUN NO. 308

SAMPLE NO. 16

DATE 11 -7 - 1979

COAL TYPE- NA2 CO3 TREATED NEW MEXICO SUB-BITUM.

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.645	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.332	LB/HR	COAL FED	1369.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	909.0	GRAMS
HYDROGEN VELOCITY	.5932	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	53.90	0.
HYDROGEN	4.020	0.
OXYGEN	13.89	0.
NITROGEN	1.230	0.
SULFUR	.8800	0.
ASH	26.00	39.16

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5600	4.881	8.291
CARBON DIOXIDE	.2700E-01	.2353	.6281
METHANE	5.750	50.00	48.64
ETHYLENE	0.	0.	0.
ETHANE	.5100E-01	.8873	.8090
BENZENE	.1430	7.470	5.898
TOLUENE	.1000E-02	.6094E-01	.4864E-01
XYLENE	0.	0.	0.
LIGHT OIL			
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.28
TOTAL		63.54	79.59

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.53	8.48	0.	0.	0.	5.95
HYDROCARBON GASES	50.9	228.	0.	0.	0.	49.5
CARBON OXIDES	5.12	0.	27.7	0.	0.	8.92
WATER	0.	31.2	72.3	0.	0.	15.3
AMMONIA	0.	6.56	0.	100.	0.	2.02
HYDROGEN SULFIDE	0.	1.37	0.	0.	100.	1.26
CHAR	0.	0.	0.	0.	0.	54.6
TOTAL	63.5	276.	100.	100.	100.	137.

HYDROGEN CONSUMPTION-	.7062E-01	LB HYDROGEN/LB COAL
	1.572	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4811	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.66	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	72.80	PERCENT

RUN NO. 309

SAMPLE NO. 1

DATE 11 -8 - 1979

COAL TYPE- TREATED WYDDAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.569	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.066	LB/HR	COAL FED	750.0	GRAMS
HYDROGEN FLOW RATE	1.127	LB/HR	CHAR	528.0	GRAMS
HYDROGEN VELOCITY	.5946	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	800.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	800.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	64.60	0.
HYDROGEN	4.670	0.
OXYGEN	11.27	0.
NITROGEN	.9600	0.
SULFUR	.7500	0.
ASH	17.75	25.21

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.8600E-01	.8453	1.549
CARBON DIOXIDE	0.	0.	0.
METHANE	1.070	10.49	11.01
ETHYLENE	0.	0.	0.
ETHANE	.1770	3.473	3.414
BENZENE	.4360E-01	2.569	2.187
TOLUENE	.2000E-02	.1374	.1183
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	14.42
TOTAL		17.52	32.69

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.71	3.16	0.	0.	0.	2.00
HYDROCARBON GASES	14.0	60.8	0.	0.	0.	14.4
CARBON OXIDES	.845	0.	6.45	0.	0.	1.55
WATER	0.	28.2	93.5	0.	0.	14.4
AMMONIA	0.	4.41	0.	100.	0.	1.42
HYDROGEN SULFIDE	0.	1.00	0.	0.	100.	.969
CHAR	0.	0.	0.	0.	0.	64.0
TOTAL	17.5	97.6	100.	100.	100.	99.1

HYDROGEN CONSUMPTION-	-.1121E-02	LB HYDROGEN/LB COAL
	-.2083E-01	ATUM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2457 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	17.52	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	25.73	PERCENT

RUN NO. 310

SAMPLE NO. 1

DATE 11 -14 - 1979

COAL TYPE- TREATED WYODAK

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.629 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7630	LB/HR	COAL FED	450.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.5800	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	810.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	800.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	64.60	0.
HYDROGEN	4.670	0.
OXYGEN	11.27	0.
NITROGEN	.9600	0.
SULFUR	.7500	0.
ASH	17.75	32.08

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.9400E-01	1.247	2.284
CARBON DIOXIDE	.6000E-02	.7962E-01	.2291
METHANE	2.294	30.37	31.86
ETHYLENE	0.	0.	0.
ETHANE	.3170	8.396	8.254
BENZENE	.7900E-01	6.282	5.348
TOLUENE	.1000E-02	.9277E-01	.7985E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	13.76
TOTAL		46.47	61.81

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.38	7.41	0.	0.	0.	5.43
HYDROCARBON GASES	38.8	170.	0.	0.	0.	40.1
CARBON OXIDES	1.33	0.	10.7	0.	0.	2.51
WATER	0.	26.9	89.3	0.	0.	13.8
AMMONIA	0.	4.41	0.	100.	0.	1.42
HYDROGEN SULFIDE	0.	1.00	0.	0.	100.	.969
CHAR	0.	0.	0.	0.	0.	45.7
TOTAL	46.5	210.	100.	100.	100.	110.

HYDROGEN CONSUMPTION- .5136E-01 LB HYDROGEN/LB COAL
.9541 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3856 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 46.47 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 70.79 PERCENT

RUN NO. 310

SAMPLE NO. 2

DATE 11 -14 - 1979

COAL TYPE- TREATED WYDDAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.566	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.7630	LB/HR	COAL FED	450.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.6121	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	870.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	64.60	0.
HYDROGEN	4.670	0.
OXYGEN	11.27	0.
NITROGEN	.9600	0.
SULFUR	.7500	0.
ASH	17.75	32.08

	PRODUCT CONC. IN GAS, MULE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1200E-01	.1592	.2916
CARBON DIOXIDE	.2000E-02	.2654E-01	.7638E-01
METHANE	3.236	42.84	44.94
ETHYLENE	0.	0.	0.
ETHANE	.8500E-01	2.251	2.213
BENZENE	.2000E-01	1.591	1.354
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.16

TOTAL	46.87	64.04
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.59	1.85	0.	0.	0.	1.35
HYDROCARBON GASES	45.1	200.	0.	0.	0.	47.2
CARBON OXIDES	.186	0.	1.62	0.	0.	.368
WATER	0.	29.7	98.4	0.	0.	15.2
AMMONIA	0.	4.41	0.	100.	0.	1.42
HYDROGEN SULFIDE	0.	1.00	0.	0.	100.	.969
CHAR	0.	0.	0.	0.	0.	45.7

TOTAL	46.9	244.	100.	100.	100.	112.
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HYDROGEN CONSUMPTION-	.6709E-01	LB HYDROGEN/LB COAL
	1.246	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4987	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	46.87	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	77.00	PERCENT

RUN NO. 310

SAMPLE NO. 3

DATE 11 -14 - 1979

COAL TYPE- TREATED WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.534	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7630	LB/HR	COAL FED	450.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.6282	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	64.60	0.
HYDROGEN	4.670	0.
OXYGEN	11.27	0.
NITROGEN	.9600	0.
SULFUR	.7500	0.
ASH	17.75	32.08

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.7000E-02	.9288E-01	.1701
CARBON DIOXIDE	0.	0.	0.
METHANE	2.609	34.54	36.23
ETHYLENE	0.	0.	0.
ETHANE	.3800E-01	1.006	.9895
BENZENE	.2100E-01	1.670	1.422
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	15.31

TOTAL	37.31	54.12
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.67	1.94	0.	0.	0.	1.42
HYDROCARBON GASES	35.5	164.	0.	0.	0.	37.2
CARBON OXIDES	.929E-01	0.	.709	0.	0.	.170
WATER	0.	29.9	99.3	0.	0.	15.3
AMMONIA	0.	4.41	0.	100.	0.	1.42
HYDROGEN SULFIDE	0.	1.00	0.	0.	100.	.969
CHAR	0.	0.	0.	0.	0.	45.7
TOTAL	37.3	201.	100.	100.	100.	102.

HYDROGEN CONSUMPTION-	.4724E-01	LB HYDROGEN/LB COAL
	.8776	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4256	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	37.31	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	61.98	PERCENT

RUN NO. 311

SAMPLE NO. 1

DATE 11 -15 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.487	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.441	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.127	LB/HR	COAL FED	1690.	GRAMS
HYDROGEN VELOCITY	.6500	FT/SEC	CHAR	891.3	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	20.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2150	1.467	2.639
CARBON DIOXIDE	.4000E-01	.0700	.7716
METHANE	1.213	8.259	8.508
ETHYLENE	0.	0.	0.
ETHANE	.2400	3.269	3.156
BENZENE	.7000E-01	2.863	2.394
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	10.28
TOTAL		16.13	27.75

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.86	3.31	0.	0.	0.	2.39
HYDROCARBON GASES	11.5	49.5	0.	0.	0.	11.7
CARBON OXIDES	1.74	0.	19.5	0.	0.	0.41
WATER	0.	20.4	81.5	0.	0.	10.3
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	47.0
TOTAL	16.1	83.6	100.	100.	100.	81.4

HYDROGEN CONSUMPTION-	-.8224E-02	LB HYDROGEN/LB COAL
	-.1434	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.1516	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	16.13	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	23.40	PERCENT

RUN NO. 311

SAMPLE NO. 2

DATE 11 -15 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.973	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.441	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	1.127	LB/HR	COAL FED	1690.
HYDROGEN VELOCITY	.6500	FT/SEC	CHAR	891.3
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.
PREHEAT TEMP.	900.0	DEG C	BTX	0.
HYDROGEN PRESSURE	1000.	PSI	WATER	0.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	20.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3400	2.320	4.173
CARBON DIOXIDE	.2300E-01	.1570	.4437
METHANE	4.880	33.23	34.23
ETHYLENE	0.	0.	0.
ETHANE	.7700E-01	1.049	1.013
BENZENE	.1230	5.031	4.206
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	9.567

TOTAL	41.78	53.63
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.03	5.81	0.	0.	0.	4.21
HYDROCARBON GASES	34.3	157.	0.	0.	0.	35.2
CARBON OXIDES	2.48	0.	24.1	0.	0.	4.62
WATER	0.	19.0	75.9	0.	0.	9.57
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	47.0

TOTAL	41.8	192.	100.	100.	100.	107.
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HYDROGEN CONSUMPTION-	.4613E-01	LB HYDROGEN/LB COAL
	.8045	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3252	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	41.78	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	67.67	PERCENT

RUN NO. 311

SAMPLE NO. 3

DATE 11 -15 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.460 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.441	LB/HR	COAL FED	1690.	GRAMS
HYDROGEN FLOW RATE	1.127	LB/HR	CHAR	891.3	GRAMS
HYDROGEN VELOCITY	.6500	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.00	20.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	2.220	15.15	27.25
CARBON DIOXIDE	.2300	1.570	4.437
METHANE	4.760	32.41	33.39
ETHYLENE	0.	0.	0.
ETHANE	.1340	1.825	1.762
BENZENE	.3100	12.68	10.60
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	-8.528

TOTAL 63.63 68.91

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	12.7	14.6	0.	0.	0.	10.6
HYDROCARBON GASES	34.2	156.	0.	0.	0.	35.2
CARBON OXIDES	14.7	0.	160.	0.	0.	31.7
WATER	0.	-16.9	-67.6	0.	0.	-8.53
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	47.0

TOTAL 63.6 164. 100. 100. 100. 123.

HYDROGEN CONSUMPTION- .3207E-01 LB HYDROGEN/LB COAL
.5593 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.1739E-01 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 58.68 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 70.49 PERCENT

RUN NO. 313

SAMPLE NO. 1

DATE 11 -21 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.556	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8384	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.023	LB/HR	COAL FED	399.4	GRAMS
HYDROGEN VELOCITY	.5899	FT/SEC	CHAR	182.0	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN		
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	20.12

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3900E-01	.4818	.7336
CARBON DIOXIDE	.2000E-02	.2471E-01	.5911E-01
METHANE	1.509	18.60	16.22
ETHYLENE	0.	0.	0.
ETHANE	.2600	6.412	5.240
BENZENE	.7550E-01	5.590	3.956
TOLUENE	.1000E-02	.8638E-01	.6180E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	31.21
TOTAL		31.19	57.48

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.68	6.85	0.	0.	0.	4.02
HYDROCARBON GASES	25.0	113.	0.	0.	0.	21.5
CARBON OXIDES	.507	0.	1.64	0.	0.	.793
WATER	0.	76.3	98.4	0.	0.	31.2
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	31.2	202.	100.	100.	100.	99.8

HYDROGEN CONSUMPTION-	.4208E-01	LB HYDROGEN/LB COAL
	.8516	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6940	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	31.19	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	43.27	PERCENT

RUN NO. 313

SAMPLE NO. 2

DATE 11 -21 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.112	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8384	LB/HR	COAL FED	399.4	GRAMS
HYDROGEN FLOW RATE	1.023	LB/HR	CHAR	182.0	GRAMS
HYDROGEN VELOCITY	.5899	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	20.12

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2500E-01	.3088	.4702
CARBON DIOXIDE	.1700E-02	.2100E-01	.5025E-01
METHANE	2.900	35.74	31.17
ETHYLENE	0.	0.	0.
ETHANE	.6760E-01	1.667	1.362
BENZENE	.1250	9.256	6.550
TOLUENE	.9000E-02	.7774	.5562
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	31.39

TOTAL	47.77	71.55
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	S	
	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	10.0	12.2	0.	0.	0.	7.11
HYDROCARBON GASES	37.4	178.	0.	0.	0.	32.5
CARBON OXIDES	.330	0.	1.08	0.	0.	.520
WATER	0.	76.7	98.9	0.	0.	31.4
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	40.1

TOTAL	47.8	273.	100.	100.	100.	114.
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HYDROGEN CONSUMPTION-	.7152E-01	LB HYDROGEN/LB COAL
	1.447	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.7891	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	47.77	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	67.38	PERCENT

RUN NO. 313

SAMPLE NO. 3

DATE 11 -21 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.669	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8384	LB/HR	COAL FED	399.4	GRAMS
HYDROGEN FLOW RATE	1.023	LB/HR	CHAR	182.0	GRAMS
HYDROGEN VELOCITY	.5899	FT/SFC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	20.12

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4020	4.966	7.561
CARBON DIOXIDE	.1700E-01	.2100	.5025
METHANE	3.690	45.48	39.66
ETHYLENE	0.	0.	0.
ETHANE	.4800E-01	1.184	.9673
BENZENE	.1270	9.404	6.654
TOLUENE	.1000E-02	.8638E-01	.6180E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	26.46
TOTAL		61.33	81.87

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.49	11.4	0.	0.	0.	6.72
HYDROCARBON GASES	46.7	223.	0.	0.	0.	40.6
CARBON OXIDES	5.18	0.	16.6	0.	0.	8.06
WATER	0.	64.7	83.4	0.	0.	26.5
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	61.3	306.	100.	100.	100.	124.

HYDROGEN CONSUMPTION-	.8489E-01	LB HYDROGEN/LB COAL
	1.718	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.7786	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.24	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	77.93	PERCENT

RUN NO. 313

SAMPLE NO. 4

DATE 11 -21 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.225	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8384	LB/HR	COAL FED	399.4	
COAL FEED RATE	.8384	LB/HR	COAL FED	399.4	GRAMS
HYDROGEN FLOW RATE	1.023	LB/HR	CHAR	182.0	GRAMS
HYDROGEN VELOCITY	.5899	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	

ASH	9.170	20.12
	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT
CARBON MONOXIDE	.4700	5.806
CARBON DIOXIDE	.4000E-02	.4942E-01
METHANE	3.314	40.85
ETHYLENE	0.	0.
ETHANE	.3300E-01	.8138
BENZENE	.8800E-01	6.516
TOLUENE	0.	0.
XYLENE	0.	0.
LIGHT OIL	0.	0.
WATER	0.	25.95
	TOTAL	54.03
		75.81

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.52	7.85	0.	0.	0.	4.61
HYDROCARBON GASES	41.7	200.	0.	0.	0.	36.3
CARBON OXIDES	5.86	0.	18.2	0.	0.	8.96
WATER	0.	63.4	81.8	0.	0.	26.0
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	40.1
TOTAL	54.0	277.	100.	100.	100.	118.

HYDROGEN CONSUMPTION-	.7311E-01	LB HYDROGEN/LB COAL
	1.480	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.7460	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	54.03	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	71.41	PERCENT

RUN NO. 314

SAMPLE NO. 1

DATE 11 -27 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 60% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 5.032 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.375	LB/HR	COAL FED	382.2	GRAMS
HYDROGEN FLOW RATE	.8621	LB/HR	CHAR	181.8	GRAMS
HYDROGEN VELOCITY	.4971	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	22.70

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4170	2.281	4.102
CARBON DIOXIDE	.2500E-01	.1367	.3865
METHANE	4.052	22.11	22.78
ETHYLENE	0.	0.	0.
ETHANE	.2400E-01	.2620	.2530
BENZENE	.1680	5.507	4.604
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	9.786
TOTAL		30.30	41.91

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.51	76.36	0.	0.	0.	4.60
HYDROCARBON GASES	22.4	103.	0.	0.	0.	23.0
CARBON OXIDES	2.42	0.	23.2	0.	0.	4.49
WATER	0.	19.4	76.8	0.	0.	9.79
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	41.2

TOTAL	30.3	139.	100.	100.	100.	89.6
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HYDROGEN CONSUMPTION- .1953E-01 LB HYDROGEN/LB COAL
.3406 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2312 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 30.30 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 46.91 PERCENT

RUN NO. 316

SAMPLE NO. 1

DATE 11 -29 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 50% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.590	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8529	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.9758	LB/HR	COAL FED	837.9	GRAMS
HYDROGEN VELOCITY	.5626	FT/SEC	CHAR	511.2	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	17.70

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4400E-01	.4392	.7900
CARBON DIOXIDE	0.	0.	0.
METHANE	1.790	17.83	18.37
ETHYLENE	0.	0.	0.
ETHANE	.2720	5.420	5.233
BENZENE	.8400E-01	5.026	4.201
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.23
TOTAL		28.71	40.82

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.03	5.80	0.	0.	0.	4.20
HYDROCARBON GASES	23.2	101.	0.	0.	0.	23.6
CARBON OXIDES	.439	0.	3.99	0.	0.	.790
WATER	0.	24.2	96.0	0.	0.	12.2
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	56.3
TOTAL	28.7	141.	100.	100.	100.	104.

HYDROGEN CONSUMPTION-	.2071E-01	LB HYDROGEN/LB COAL
	.3610	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.2512	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	28.71	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	46.60	PERCENT

RUN NO. 316

SAMPLE NO. 2

DATE 11 -29 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 50% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.180	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	.8529	LB/HR	COAL FED	837.9 GRAMS
HYDROGEN FLOW RATE	.9758	LB/HR	CHAR	511.2 GRAMS
HYDROGEN VELOCITY	.5626	FT/SEC	LIGHT OILS	0. GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0. GRAMS
HYDROGEN PRESSURE	1000.	PSI		

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	17.70

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2100E-01	.2096	.3770
CARBON DIOXIDE	0.	0.	0.
METHANE	3.730	37.15	38.27
ETHYLENE	0.	0.	0.
ETHANE	.5800E-01	1.156	1.116
BENZENE	.1580	9.453	7.903
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.50

TOTAL	47.97	60.16
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.45	10.9	0.	0.	0.	7.90
HYDROCARBON GASES	38.3	176.	0.	0.	0.	39.4
CARBON OXIDES	.210	0.	1.90	0.	0.	.377
WATER	0.	24.8	98.1	0.	0.	12.5
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	56.3

TOTAL	48.0	222.	100.	100.	100.	123.
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HYDROGEN CONSUMPTION-	.6076E-01	LB HYDROGEN/LB COAL
	1.060	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3779	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	47.97	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	80.15	PERCENT

RUN NO. 316

SAMPLE NO. 3

DATE 11 -29 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 50% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.770	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8529	LB/HR	COAL FED	837.9	GRAMS
HYDROGEN FLOW RATE	.9758	LB/HR	CHAR	511.2	GRAMS
HYDROGEN VELOCITY	.5626	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	17.70

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.9350	5.340	9.606
CARBON DIOXIDE	.2600E-01	.2596	.7336
METHANE	4.194	41.77	43.03
ETHYLENE	0.	0.	0.
ETHANE	.4500E-01	.8966	.8657
BENZENE	.1550	9.273	7.753
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	5.965

TOTAL	57.54	67.95
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.27	10.7	0.	0.	0.	7.75
HYDROCARBON GASES	42.7	196.	0.	0.	0.	43.9
CARBON OXIDES	5.60	0.	53.2	0.	0.	10.3
WATER	0.	11.8	46.8	0.	0.	5.97
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	56.3

TOTAL	57.5	229.	100.	100.	100.	131.
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HYDROGEN CONSUMPTION-	.6441E-01	LB HYDROGEN/LB COAL
	1.123	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3158	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	57.45	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	87.76	PERCENT

RUN NO. 316

SAMPLE NO. 4

DATE 11 -29 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 50% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.360	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8529	LB/HR	COAL FED	837.9	GRAMS
HYDROGEN FLOW RATE	.9758	LB/HR	CHAR	511.2	GRAMS
HYDROGEN VELOCITY	.5626	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	17.70

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.7120	7.107	12.78
CARBON DIOXIDE	0.	0.	0.
METHANE	3.230	32.17	33.14
ETHYLENE	0.	0.	0.
ETHANE	.3300E-01	.6575	.6348
BENZENE	.1020	6.102	5.102
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	4.523

TOTAL	46.04	56.18
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.10	7.04	0.	0.	0.	5.10
HYDROCARBON GASES	32.8	151.	0.	0.	0.	33.8
CARBON OXIDES	7.11	0.	64.5	0.	0.	12.8
WATER	0.	8.97	35.5	0.	0.	4.52
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	56.3

TOTAL	46.0	177.	100.	100.	100.	119.
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HYDROGEN CONSUMPTION-	.3856E-01	LB HYDROGEN/LB COAL
	.6726	ATOM HYDROGEN/ATOM CARBON.

HEAT OF REACTION-	-.2221	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	46.04	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	66.42	PERCENT

RUN NO. 317

SAMPLE NO. 1

DATE 12 -4 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.664	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	10.72	LB/HR	COAL FED	1784.	GRAMS
HYDROGEN FLOW RATE	.6316	LB/HR	CHAR	898.5	GRAMS
HYDROGEN VELOCITY	.3642	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	35.10

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	5.895	3.516	5.907
CARBON DIOXIDE	1.796	1.071	2.828
METHANE	45.43	27.04	26.01
ETHYLENE	0.	0.	0.
ETHANE	.1080	.1286	.1160
BENZENE	1.487	5.317	4.151
TOLUENE	.2100E-01	.8759E-01	.6915E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	16.85

TOTAL	37.16	55.94
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.40	6.45	0.	0.	0.	4.22
HYDROCARBON GASES	27.2	129.7	0.	0.	0.	26.1
CARBON OXIDES	4.59	0.	26.6	0.	0.	0.74
WATER	0.	36.9	73.4	0.	0.	16.8
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	39.7

TOTAL	37.2	180.	100.	100.	100.	98.5
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HYDROGEN CONSUMPTION-	.3346E-01	LB HYDROGEN/LB COAL
	.6770	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4347	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	37.16	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	47.74	PERCENT

RUN NO. 318 SAMPLE NO. 1 DATE 12 -5 - 1979

COAL TYPE- IRLEAND MINE PITT. #8, 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 1.677 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8648	LB/HR	COAL FED	605.1	GRAMS
HYDROGEN FLOW RATE	.8621	LB/HR	CHAR	300.0	GRAMS
HYDROGEN VELOCITY	.4971	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	51.00	0.
HYDROGEN	3.790	0.
OXYGEN	6.830	0.
NITROGEN	.8100	0.
SULFUR	3.870	0.
ASH	33.70	67.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3500E-01	.4107	.7367
CARBON DIOXIDE	.1240	1.455	4.101
METHANE	2.852	33.39	34.30
ETHYLENE	0.	0.	0.
ETHANE	.2470	5.785	5.570
BENZENE	.1400	9.845	8.209
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	7.761
TOTAL		50.88	60.68

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.85	11.1	0.	0.	0.	8.21
HYDROCARBON GASES	39.2	170.	0.	0.	0.	39.9
CARBON OXIDES	1.87	0.	33.0	0.	0.	4.84
WATER	0.	15.1	67.0	0.	0.	7.76
AMMONIA	0.	4.58	0.	100.	0.	1.48
HYDROGEN SULFIDE	0.	6.38	0.	0.	100.	6.20
CHAR	0.	0.	0.	0.	0.	23.9
TOTAL	50.9	208.	100.	100.	100.	92.3

HYDROGEN CONSUMPTION- .4076E-01 LB HYDROGEN/LB COAL
.9591 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2307 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 50.88 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 60.05 PERCENT

RUN NO. 318

SAMPLE NO. 2

DATE 12 -5 - 1979

COAL TYPE- IRLEAND MINE PITT. #8, 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 5.032 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8648	LB/HR	COAL FED	605.1	GRAMS
HYDROGEN FLOW RATE	.8621	LB/HR	CHAR	300.0	GRAMS
HYDROGEN VELOCITY	.4971	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	51.00	0.
HYDROGEN	3.790	0.
OXYGEN	6.830	0.
NITROGEN	.8100	0.
SULFUR	3.870	0.
ASH	33.70	67.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3260	3.824	6.962
CARBON DIOXIDE	.2700E-01	.3168	.8930
METHANE	3.818	44.70	45.92
ETHYLENE	0.	0.	0.
ETHANE	.2000E-01	.4684	.4510
BENZENE	.5700E-01	4.009	3.342
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	6.449
TOTAL		53.31	63.92

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.01	4.60	0.	0.	0.	3.34
HYDROCARBON GASES	45.2	203.	0.	0.	0.	46.4
CARBON OXIDES	4.14	0.	44.3	0.	0.	7.75
WATER	0.	12.5	55.7	0.	0.	6.45
AMMONIA	0.	4.58	0.	100.	0.	1.48
HYDROGEN SULFIDE	0.	6.38	0.	0.	100.	6.20
CHAR	0.	0.	0.	0.	0.	23.9

TOTAL	53.3	231.	100.	100.	100.	95.6
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HYDROGEN CONSUMPTION- .4983E-01 LB HYDROGEN/LB COAL
1.173 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2721 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 53.31 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 63.98 PERCENT

RUN NO. 319

SAMPLE NO. 1

DATE 12 -6 - 1979

COAL TYPE- IRELAND MINE BIT. PITT #8, 20% IN CAC03

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 1.604 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.3703	LB/HR	COAL FED	560.5	GRAMS
HYDROGEN FLOW RATE	.9568	LB/HR	CHAR	411.9	GRAMS
HYDROGEN VELOCITY	.5517	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	51.00	0.
HYDROGEN	3.790	0.
OXYGEN	6.830	0.
NITROGEN	.8100	0.
SULFUR	3.870	0.
ASH	33.70	45.86

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.8900E-01	2.707	4.856
CARBON DIOXIDE	.8000E-02	.2434	.6860
METHANE	.3640	11.05	11.35
ETHYLENE	0.	0.	0.
ETHANE	.3900E-01	2.368	2.280
BENZENE	.2500E-01	4.558	3.800
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	7.908
TOTAL		20.92	30.88

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.56	5.15	0.	0.	0.	3.80
HYDROCARBON GASES	13.4	57.9	0.	0.	0.	13.6
CARBON OXIDES	2.95	0.	31.8	0.	0.	5.54
WATER	0.	15.4	68.2	0.	0.	7.91
AMMONIA	0.	4.58	0.	100.	0.	1.48
HYDROGEN SULFIDE	0.	6.38	0.	0.	100.	6.20
CHAR	0.	0.	0.	0.	0.	60.0

TOTAL	20.9	99.4	100.	100.	100.	98.6
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HYDROGEN CONSUMPTION- -.4021E-02 LB HYDROGEN/LB COAL
-.9462E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8405E-01 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 20.92 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 21.53 PERCENT

RUN NO. 319 SAMPLE NO. 2 DATE 12 -6 - 1979

COAL TYPE- IRELAND MINE BIT. PITT #8, 20% IN CAC03

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.208 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.3703	LB/HR	COAL FED	560.5	GRAMS
HYDROGEN FLOW RATE	.9568	LB/HR	CHAR	411.9	GRAMS
HYDROGEN VELOCITY	.5517	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	51.00	0.
HYDROGEN	3.790	0.
OXYGEN	6.830	0.
NITROGEN	.8100	0.
SULFUR	3.870	0.
ASH	33.70	45.86

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2290	6.905	18.50
CARBON DIOXIDE	.2600E-01	.7909	2.229
METHANE	3.005	91.20	93.70
ETHYLENE	0.	0.	0.
ETHANE	.7100E-01	4.311	4.151
BENZENE	.8700E-01	15.86	13.22
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	1.736

TOTAL	119.1	127.5
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	15.9	17.9	0.	0.	0.	13.2
HYDROCARBON GASES	95.5	426.	0.	0.	0.	97.8
CARBON OXIDES	7.76	0.	85.0	0.	0.	14.7
WATER	0.	3.37	15.0	0.	0.	1.74
AMMONIA	0.	4.58	0.	100.	0.	1.48
HYDROGEN SULFIDE	0.	6.38	0.	0.	100.	6.20
CHAR	0.	0.	0.	0.	0.	60.0

TOTAL	119.	459.	100.	100.	100.	195.
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HYDROGEN CONSUMPTION-	.1360	LB HYDROGEN/LB COAL
	3.199	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4712 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	64.77	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	76.74	PERCENT

RUN NO. 319 SAMPLE NO. 3 DATE 12 -6 - 1979

COAL TYPE- IRELAND MINE BIT. PITT #8, 20% IN CACD3

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.812 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.3703	LB/HR	COAL FED	580.5	GRAMS
HYDROGEN FLOW RATE	.9568	LB/HR	CHAR	411.9	GRAMS
HYDROGEN VELOCITY	.5517	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	51.00	0.
HYDROGEN	3.790	0.
OXYGEN	6.830	0.
NITROGEN	.8100	0.
SULFUR	3.870	0.
ASH	33.70	45.86

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	2.147	65.30	117.2
CARBON DIOXIDE	.1220	3.711	10.46
METHANE	1.959	59.45	61.08
ETHYLENE	0.	0.	0.
ETHANE	.3400E-01	2.064	1.988
BENZENE	.9900E-01	18.05	15.05
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	-72.25

TOTAL	148.6	133.5
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	18.0	20.4	0.	0.	0.	15.0
HYDROCARBON GASES	61.5	276.	0.	0.	0.	63.1
CARBON OXIDES	69.0	0.	723.	0.	0.	128.
WATER	0.	-140.	-623.	0.	0.	-72.2
AMMONIA	0.	4.58	0.	100.	0.	1.48
HYDROGEN SULFIDE	0.	6.38	0.	0.	100.	6.20
CHAR	0.	0.	0.	0.	0.	60.0

TOTAL	149.	166.	100.	100.	100.	201.
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HYDROGEN CONSUMPTION-	.2518E-01	LB HYDROGEN/LB COAL
	.5924	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	.5885	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	66.34	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	43.71	PERCENT

RUN NO. 320

SAMPLE NO. 1

DATE 12 -11 - 1979

COAL TYPE- ILL. #6 BIT. 40% IN RUN 311 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.645	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9733	LB/HR	COAL FED.	1159.	GRAMS
HYDROGEN FLOW RATE	.9032	LB/HR	CHAR	579.4	GRAMS
HYDROGEN VELOCITY	.5207	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	21.61

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3500E-01	.2834	.5097
CARBON DIOXIDE	.8000E-02	.6470E-01	.1831
METHANE	.6700	5.412	5.576
ETHYLENE	0.	0.	0.
ETHANE	.1330	2.150	2.075
BENZENE	.8000E-02	.3882	.3246
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.13
TOTAL		8.298	20.80

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.388	.448	0.	0.	0.	.325
HYDROCARBON GASES	7.56	32.4	0.	0.	0.	7.65
CARBON OXIDES	.348	0.	3.78	0.	0.	.693
WATER	0.	24.1	96.2	0.	0.	12.1
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	8.30	67.3	100.	100.	100.	71.4

HYDROGEN CONSUMPTION-	-.1633E-01	LB HYDROGEN/LB COAL
	-.2849	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.1632	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	0.290	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	13.59	PERCENT

RUN NO. 320

SAMPLE NO. 2

DATE 12 -11 - 1979

COAL TYPE- ILL. #6 BIT. 40% IN RUN 311 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.290	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9733	LB/HR	COAL FED	1159.	GRAMS
HYDROGEN FLOW RATE	.9032	LB/HR	CHAR	579.4	GRAMS
HYDROGEN VELOCITY	.5207	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	21.61

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1500E-01	.1214	.2185
CARBON DIOXIDE	0.	0.	0.
METHANE	3.944	31.86	32.82
ETHYLENE	0.	0.	0.
ETHANE	.6500E-01	1.051	1.014
BENZENE	.1300	6.309	5.274
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.47
TOTAL		39.34	51.80

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.31	7.28	0.	0.	0.	5.27
HYDROCARBON GASES	32.9	151.	0.	0.	0.	33.8
CARBON OXIDES	.121	0.	1.11	0.	0.	.218
WATER	0.	24.7	98.9	0.	0.	12.5
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	39.3	193.	100.	100.	100.	102.

HYDROGEN CONSUMPTION-	.4659E-01	LB HYDROGEN/LB COAL
	.8126	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3503	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	39.34	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	66.71	PERCENT

RUN NO. 320

SAMPLE NO. 3

DATE 12 -11 - 1979

COAL TYPE- ILL. #6 BIT. 40% IN RUN 311 CHAR

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.934 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9733	LB/HR	COAL FED	1159.	GRAMS
HYDROGEN FLOW RATE	.9032	LB/HR	CHAR	579.4	GRAMS
HYDROGEN VELOCITY	.5207	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	21.61

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3050	2.469	4.442
CARBON DIOXIDE	.2400E-01	.1940	.5493
METHANE	4.740	38.29	39.45
ETHYLENE	0.	0.	0.
ETHANE	.4200E-01	.6788	.6554
BENZENE	.1900	9.220	7.708
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	9.308
TOTAL		50.85	62.11

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.22	10.6	0.	0.	0.	7.71
HYDROCARBON GASES	39.0	179.	0.	0.	0.	40.1
CARBON OXIDES	2.66	0.	26.2	0.	0.	4.99
WATER	0.	18.4	73.8	0.	0.	9.31
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	43.9

TOTAL	50.9	219.	100.	100.	100.	113.
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HYDROGEN CONSUMPTION	.5004E-01	LB HYDROGEN/LB COAL
	1.035	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3393 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	50.85	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	81.21	PERCENT

RUN NO. 320

SAMPLE NO. 4

DATE 12 -11 - 1979

COAL TYPE- ILL. #6 BIT. 40% IN RUN 311 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.579	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9733	LB/HR	COAL FED	1159.	GRAMS
HYDROGEN FLOW RATE	.9032	LB/HR	CHAR	579.4	GRAMS
HYDROGEN VELOCITY	.5207	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	21.61

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5500E-01	.4453	.8010
CARBON DIOXIDE	.1900E-01	.1538	.4348
METHANE	1.710	13.81	14.23
ETHYLENE	0.	0.	0.
ETHANE	.2900E-01	.4687	.4525
BENZENE	.3900E-01	1.893	1.582
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	11.74

TOTAL	16.77	29.24
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.89	2.18	0.	0.	0.	1.58
HYDROCARBON GASES	14.3	65.4	0.	0.	0.	14.7
CARBON OXIDES	.599	0.	6.90	0.	0.	1.24
WATER	0.	23.3	93.1	0.	0.	11.7
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	16.0	101.	100.	100.	100.	79.8

HYDROGEN CONSUMPTION-	.6359E-03	LB HYDROGEN/LB COAL
	.1109E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2153 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	16.77	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	27.95	PERCENT

RUN NO. 321

SAMPLE NO. 1

DATE 12 -13 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.129	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.111	LB/HR	COAL FED	638.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	138.0	GRAMS
HYDROGEN VELOCITY	.2739	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	42.39

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2320	2.303	3.507
CARBON DIOXIDE	.1300E-01	.1291	.3088
METHANE	.8660	8.579	7.481
ETHYLENE	0.	0.	0.
ETHANE	.2670	5.292	4.324
BENZENE	.2400E-01	1.428	1.011
TOLUENE	.2000E-02	.1388	.9934E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	29.23

TOTAL	17.87	45.96
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.57	1.91	0.	0.	0.	1.11
HYDROCARBON GASES	13.9	60.5	0.	0.	0.	11.8
CARBON OXIDES	2.43	0.	7.90	0.	0.	3.82
WATER	0.	71.4	92.1	0.	0.	29.2
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	13.7

TOTAL	17.9	140.	100.	100.	100.	61.9
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HYDROGEN CONSUMPTION-	.1642E-01	LB HYDROGEN/LB COAL
	.3323	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6403	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	17.87	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	21.91	PERCENT

RUN NO. 321

SAMPLE NO. 2

DATE 12 -13 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.257	SECONDS

NOMINAL CONDITIONS -

COAL FEED RATE	1.111	LB/HR	COAL FED	638.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	138.0	GRAMS
HYDROGEN VELOCITY	.2739	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	42.39

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4070	4.041	6.152
CARBON DIOXIDE	.1300E-01	.1291	.3088
METHANE	2.063	20.44	17.82
ETHYLENE	0.	0.	0.
ETHANE	.5940	11.77	9.621
BENZENE	.1610	9.581	6.780
TOLUENE	.6000E-02	.4165	.2980
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	27.53
TOTAL		46.38	68.51

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	10.0	12.1	0.	0.	0.	7.08
HYDROCARBON GASES	32.2	141.	0.	0.	0.	27.4
CARBON OXIDES	4.17	0.	13.3	0.	0.	6.46
WATER	0.	67.3	86.7	0.	0.	27.5
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	13.7

TOTAL	46.4	226.	100.	100.	100.	84.5
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HYDROGEN CONSUMPTION-	.5219E-01	LB HYDROGEN/LB COAL
	1.056	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6739	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	46.38	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	57.37	PERCENT

RUN NO. 321

SAMPLE NO. 3

DATE 12 -13 - 1979

COAL TYPE- MYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.386	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.111	LB/HR	COAL FED	638.0	GRAMS
HYDROGEN FLOW RATE	1.089	LB/HR	CHAR	138.0	GRAMS
HYDROGEN VELOCITY	.2739	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.0900	0.
SULFUR	.8900	0.
ASH	9.170	42.39

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4200	4.170	6.349
CARBON DIOXIDE	.2200E-01	.2184	.5226
METHANE	1.619	16.04	13.99
ETHYLENE	0.	0.	0.
ETHANE	.4760	9.434	7.709
BENZENE	.1780	10.59	7.496
TOLUENE	.3000E-02	.2083	.1490
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	27.22
TOTAL		40.66	63.44

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	10.0	13.0	0.	0.	0.	7.64
HYDROCARBON GASES	25.5	111.	0.	0.	0.	21.7
CARBON OXIDES	4.39	0.	14.2	0.	0.	6.87
WATER	0.	66.5	85.8	0.	0.	27.2
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	13.7

TOTAL	40.7	197.	100.	100.	100.	79.4
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HYDROGEN CONSUMPTION-	.4003E-01	LB HYDROGEN/LB COAL
	.8100	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.6285	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	40.66	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.42	PERCENT

RUN NO. 321

SAMPLE NO. 4

DATE 12 -13 - 1979

COAL TYPE- MYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	8.515	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.111	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.089	LB/HR	COAL FED	638.0	GRAMS
HYDROGEN VELOCITY	.2739	FT/SEC	CHAR	138.0	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	42.39

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3480	3.455	5.261
CARBON DIOXIDE	.7000E-02	.6951E-01	.1663
METHANE	1.376	13.63	11.89
ETHYLENE	0.	0.	0.
ETHANE	.3940	7.809	6.381
BENZENE	.1260	7.498	5.306
TOLUENE	.1000E-02	.6942E-01	.4967E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	28.22

TOTAL	32.53	57.27
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.57	9.13	0.	0.	0.	5.36
HYDROCARBON GASES	21.4	93.9	0.	0.	0.	18.3
CARBON OXIDES	3.52	0.	11.1	0.	0.	5.43
WATER	0.	68.9	88.9	0.	0.	28.2
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	13.7

TOTAL	32.5	178.	100.	100.	100.	73.2
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HYDROGEN CONSUMPTION-	.3219E-01	LB HYDROGEN/LB COAL
	.6514	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6354	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	32.53	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	39.34	PERCENT

RUN NO. 322

SAMPLE NO. 1

DATE 12 -18 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 2.188 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7273	LB/HR	COAL FED	352.0	GRAMS
HYDROGEN FLOW RATE	.9884	LB/HR	CHAR	89.70	GRAMS
HYDROGEN VELOCITY	.2424	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	725.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	35.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1730	2.380	3.624
CARBON DIOXIDE	.1100E-01	.1513	.3621
METHANE	.6490	8.908	7.768
ETHYLENE	0.	0.	0.
ETHANE	.2010	5.520	4.511
BENZENE	.1800E-01	1.484	1.050
TOLUENE	.1000E-02	.9619E-01	.6882E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	29.11
TOTAL		18.54	46.49

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.58	1.92	0.	0.	0.	1.12
HYDROCARBON GASES	14.4	62.9	0.	0.	0.	12.3
CARBON OXIDES	2.53	0.	8.27	0.	0.	3.99
WATER	0.	71.1	91.7	0.	0.	29.1
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	18.0
TOTAL	18.5	142.	100.	100.	100.	66.7

HYDROGEN CONSUMPTION- .1730E-01 LB HYDROGEN/LB COAL
.3501 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6467 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 18.54 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 22.79 PERCENT

RUN NO. 322

SAMPLE NO. 2

DATE 12 -18 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.377	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7273	LB/HR	COAL FED	352.0	GRAMS
HYDROGEN FLOW RATE	.9884	LB/HR	CHAR	89.70	GRAMS
HYDROGEN VELOCITY	.2424	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	725.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	35.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2390	3.288	5.006
CARBON DIOXIDE	.1200E-01	.1651	.3950
METHANE	1.065	14.62	12.75
ETHYLENE	0.	0.	0.
ETHANE	.3350	9.200	7.518
BENZENE	.5000E-01	4.123	2.917
TOLUENE	.3000E-02	.2886	.2065
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	28.19

TOTAL	31.68	56.98
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.41	5.36	0.	0.	0.	3.12
HYDROCARBON GASES	23.8	104.	0.	0.	0.	20.3
CARBON OXIDES	3.45	0.	11.2	0.	0.	5.40
WATER	0.	68.9	88.8	0.	0.	28.2
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	18.0

TOTAL	31.7	184.	100.	100.	100.	77.2
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HYDROGEN CONSUMPTION-	.3466E-01	LB HYDROGEN/LB COAL
	.7013	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6690	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	31.68	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	39.30	PERCENT

RUN NO. 322

SAMPLE NO. 3

DATE 12 -18 - 1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.565	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7273	LB/HR	COAL FED	352.0	GRAMS
HYDROGEN FLOW RATE	.9884	LB/HR	CHAR	89.70	GRAMS
HYDROGEN VELOCITY	.2424	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	725.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	25.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.0000	4.127	6.204
CARBON DIOXIDE	.1500E-01	.2064	.4937
METHANE	1.006	13.81	12.04
ETHYLENE	0.	0.	0.
ETHANE	.3570	9.804	8.012
BENZENE	.1290	10.64	7.527
TOLUENE	.8000E-02	.7695	.5506
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	27.29
TOTAL		39.35	62.20

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	11.4	13.9	0.	0.	0.	8.08
HYDROCARBON GASES	23.6	102.	0	0.	0.	20.1
CARBON OXIDES	4.33	0.	14.0	0.	0.	6.78
WATER	0.	66.7	86.0	0.	0.	27.3
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	18.0
TOTAL	39.4	188.	100.	100.	100.	82.4

HYDROGEN CONSUMPTION-	.3655E-01	LB HYDROGEN/LB COAL
	.7396	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6189	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	39.35	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	45.48	PERCENT

RUN NO. 322

SAMPLE NO. 4

DATE 12-18-1979

COAL TYPE- WYODAK

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 8.753 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.7273	LB/HR	COAL FED	352.0	GRAMS
HYDROGEN FLOW RATE	.9884	LB/HR	CHAR	89.70	GRAMS
HYDROGEN VELOCITY	.2424	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	725.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.130	0.
OXYGEN	25.62	0.
NITROGEN	.8900	0.
SULFUR	.8900	0.
ASH	9.170	35.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2710	3.728	5.676
CARBON DIOXIDE	.8000E-02	.1101	.2633
METHANE	.8970	12.31	10.74
ETHYLENE	0.	0.	0.
ETHANE	.2950	8.101	6.620
BENZENE	.9100E-01	7.503	5.310
TOLUENE	.3000E-02	.2886	.2065
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	27.87
TOTAL		32.04	56.68

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.79	9.44	0.	0.	0.	5.52
HYDROCARBON GASES	20.4	88.6	0.	0.	0.	17.4
CARBON OXIDES	3.84	0.	12.2	0.	0.	5.94
WATER	0.	68.1	87.8	0.	0.	27.9
AMMONIA	0.	4.62	0.	100.	0.	1.19
HYDROGEN SULFIDE	0.	1.35	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	18.0
TOTAL	32.0	172.	100.	100.	100.	76.9

HYDROGEN CONSUMPTION- .2978E-01 LB HYDROGEN/LB COAL
.6027 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6267 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 32.04 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 37.68 PERCENT

RUN NO. 323

SAMPLE NO. 1

DATE 12 -19 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN RUN 320 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.563	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.6295	LB/HR	COAL FED	666.0	GRAMS
HYDROGEN FLOW RATE	1.014	LB/HR	CHAR	459.0	GRAMS
HYDROGEN VELOCITY	.5845	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	15.67

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAE COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2000E-01	.2810	.5055
CARBON DIOXIDE	.2000E-02	.2810E-01	.7943E-01
METHANE	1.130	15.84	16.32
ETHYLENE	0.	0.	0.
ETHANE	.2520	7.068	6.824
BENZENE	.5000E-01	4.211	3.520
TOLUENE	.2000E-02	.1965	.1661
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.22

TOTAL	27.63	39.64
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAE COAL
LIQUIDS	4.41	5.12	0.	0.	0.	3.69
HYDROCARBON GASES	22.9	97.6	0.	0.	0.	23.1
CARBON OXIDES	.309	0.	3.09	0.	0.	.585
WATER	0.	24.2	96.9	0.	0.	12.2
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	65.2

TOTAL	27.6	137.	100.	100.	100.	111.
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HYDROGEN CONSUMPTION-	.1869E-01	LB HYDROGEN/LB COAL
	.3260	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.2444	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	27.63	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	44.60	PERCENT

RUN NO. 323

SAMPLE NO. 2

DATE 12 -19 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN RUN 320 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.126	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.6295	LB/HR	COAL FED	666.0	GRAMS
HYDROGEN FLOW RATE	1.014	LB/HR	CHAR	459.0	GRAMS
HYDROGEN VELOCITY	.5845	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED MTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	15.67

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1800E-01	.2529	.4549
CARBON DIOXIDE	.1000E-02	.1405E-01	.3972E-01
METHANE	2.479	34.75	35.80
ETHYLENE	0.	0.	0.
ETHANE	.8100E-01	2.272	2.193
BENZENE	.1210	10.19	8.519
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	12.29
TOTAL		47.48	59.30

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	10.2	11.8	0.	0.	0.	8.52
HYDROCARBON GASES	37.0	168.	0.	0.	0.	38.0
CARBON OXIDES	.267	0.	2.58	0.	0.	.495
WATER	0.	24.4	97.4	0.	0.	12.3
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	65.2
TOTAL	47.5	215.	100.	100.	100.	131.

HYDROGEN CONSUMPTION-	.5744E-01	LB HYDROGEN/LB COAL
	1.002	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3537 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	47.48	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	78.43	PERCENT

RUN NO. 323

SAMPLE NO. 3

DATE 12 -19 - 1979

COAL TYPE- BATTELLE ILLINOIS #6 40% IN RUN 320 CHAR

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.689	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.6295	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.014	LB/HR	COAL FED	666.0	GRAMS
HYDROGEN VELOCITY	.5845	FT/SEC	CHAR	459.0	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.00	0.
NITROGEN	1.200	0.
SULFUR	4.200	0.
ASH	10.80	15.67

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAE COAL CONV. TO PRODUCT
CARBON MONOXIDE	.8100E-01	1.138	2.047
CARBON DIOXIDE	.4000E-02	.5621E-01	.1589
METHANE	3.173	44.48	45.83
ETHYLENE	0.	0.	0.
ETHANE	.5500E-01	1.543	1.489
BENZENE	.1150	9.685	8.097
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	11.17
TOTAL		56.90	68.78

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAE COAL
LIQUIDS	9.89	11.2	0.	0.	0.	8.10
HYDROCARBON GASES	46.0	211.	0.	0.	0.	47.3
CARBON OXIDES	1.19	0.	11.5	0.	0.	2.21
WATER	0.	22.1	88.5	0.	0.	11.2
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.25	0.	0.	100.	5.00
CHAR	0.	0.	0.	0.	0.	65.2
TOTAL	56.9	254.	100.	100.	100.	141.

HYDROGEN CONSUMPTION-	.7725E-01	LB HYDROGEN/LB COAL
	1.347	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4178 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	56.90	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	94.30	PERCENT

RUN NO. 324

SAMPLE NO. 1

DATE 12 -20 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.158	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.035	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.045	LB/HR	COAL FED	375.8	GRAMS
HYDROGEN VELOCITY	1.051	FT/SEC	CHAR	154.6	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	42.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2670	2.728	4.584
CARBON DIOXIDE	.2600E-01	.2657	.7014
METHANE	1.061	10.82	10.41
ETHYLENE	0.	0.	0.
ETHANE	.4220	8.608	7.762
BENZENE	.3900E-01	2.389	1.865
TOLUENE	.1000E-01	.7145	.5641
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	19.44
TOTAL		25.52	45.32

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.10	3.82	0.	0.	0.	2.43
HYDROCARBON GASES	19.4	82.3	0.	0.	0.	18.2
CARBON OXIDES	2.99	0.	15.3	0.	0.	5.29
WATER	0.	42.5	84.7	0.	0.	19.4
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	28.5

TOTAL	25.5	136.	100.	100.	100.	76.7
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HYDROGEN CONSUMPTION-	.1510E-01	LB HYDROGEN/LB COAL
	.3055	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4027	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	25.52	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	30.82	PERCENT

RUN NO. 324

SAMPLE NO. 2

DATE 12 -20 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.236	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.035	LB/HR	COAL FED	375.8	GRAMS
HYDROGEN FLOW RATE	1.045	LB/HR	CHAR	154.6	GRAMS
HYDROGEN VELOCITY	1.051	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX.	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI			

TOTAL ACCUMULATED MTS.

COAL ANALYSIS, %

CARBON	59.30
HYDROGEN	4.180
OXYGEN	16.80
NITROGEN	1.230
SULFUR	.8100
ASH	17.68

CHAR ANALYSIS, %

0.
0.
0.
0.
0.
42.98

PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAP COAL CONV. TO PRODUCT
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CARBON MONOXIDE	.3240	3.311	5.562
CARBON DIOXIDE	.2200E-01	.2248	.5935
METHANE	1.193	12.16	11.70
ETHYLENE	0.	0.	0.
ETHANE	.4630	9.445	8.516
BENZENE	.6200E-01	3.797	2.965
TOLUENE	.1000E-01	.7145	.5641
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	18.90

TOTAL	29.66	48.80
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAP COAL
LIQUIDS	4.51	5.49	0.	0.	0.	3.53
HYDROCARBON GASES	21.6	91.6	0.	0.	0.	20.2
CARBON DIOXIDES	3.54	0.	17.7	0.	0.	6.16
WATER	0.	41.4	82.3	0.	0.	18.9
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	28.5

TOTAL	29.7	146.	100.	100.	100.	80.2
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HYDROGEN CONSUMPTION-	.1923E-01	LB HYDROGEN/LB COAL
	.3892	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-1.3984	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	29.66	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	35.47	PERCENT

RUN NO. 324

SAMPLE NO. 3

DATE 12 -20 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.315	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.035	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.045	LB/HR	COAL FED	375.8	GRAMS
HYDROGEN VELOCITY	1.051	FT/SEC	CHAR	154.6	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	42.98

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2770	2.831	4.755
CARBON DIOXIDE	.8700E-01	.8891	2.347
METHANE	1.226	12.50	12.03
ETHYLENE	0.	0.	0.
ETHANE	.4540	9.261	8.351
BENZENE	.6100E-01	3.736	2.917
TOLUENE	.8000E-02	.5716	.4513
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	17.98

TOTAL	29.79	48.83
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.31	5.22	0.	0.	0.	3.37
HYDROCARBON GASES	21.8	92.6	0.	0.	0.	20.4
CARBON OXIDES	3.72	0.	21.7	0.	0.	7.10
WATER	0.	39.3	78.3	0.	0.	18.0
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	28.5

TOTAL	29.8	145.	100.	100.	100.	80.2
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HYDROGEN CONSUMPTION-	.1868E-01	LB HYDROGEN/LB COAL
	.3780	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4021	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	29.79	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	35.69	PERCENT

RUN NO. 325 SAMPLE NO. 1 DATE 1 -3 - 1980

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 1.075 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9984	LB/HR	COAL FED	619.0	GRAMS
HYDROGEN FLOW RATE	1.052	LB/HR	CHAR	295.0	GRAMS
HYDROGEN VELOCITY	1.058	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	37.10

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1720	1.834	0.081
CARBON DIOXIDE	.3900E-01	.4159	1.098
METHANE	.7210	7.670	7.380
ETHYLENE	0.	0.	0.
ETHANE	.2910	6.193	5.585
BENZENE	.1560E-01	.9969	.7784
TOLUENE	.3000E-02	.2237	.1766
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	20.08
TOTAL		17.33	38.18

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.22	1.49	0.	0.	0.	.955
HYDROCARBON GASES	13.9	50.6	0.	0.	0.	13.0
CARBON DIOXIDE	2.25	0.	12.5	0.	0.	4.18
WATER	0.	43.9	87.5	0.	0.	20.1
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	36.4
TOTAL	17.3	112.	100.	100.	100.	77.5

HYDROGEN CONSUMPTION- .4842E-02 LB HYDROGEN/LB COAL
.9799E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -1.3943 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 17.33 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 21.26 PERCENT

RUN NO. 325

SAMPLE NO. 2

DATE 1 -3 - 1980

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.134	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9984	LB/HR	COAL FED	619.0	GRAMS
HYDROGEN FLOW RATE	1.052	LB/HR	CHAR	298.0	GRAMS
HYDROGEN VELOCITY	1.083	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	775.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	775.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	36.72

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2000	2.132	3.582
CARBON DIOXIDE	.1000E-01	.1066	.2815
METHANE	1.450	15.42	14.84
ETHYLENE	0.	0.	0.
ETHANE	.4620	9.833	8.866
BENZENE	.7000E-01	4.473	3.493
TOLUENE	.6000E-02	.4473	.3531
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	20.43
TOTAL		32.42	51.84

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.92	5.93	0.	0.	0.	3.85
HYDROCARBON GASES	25.3	109.	0.	0.	0.	23.7
CARBON OXIDES	2.24	0.	11.0	0.	0.	3.86
WATER	0.	44.7	89.0	0.	0.	20.4
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	37.0
TOTAL	32.4	167.	100.	100.	100.	91.7

HYDROGEN CONSUMPTION-	.2788E-01	LB HYDROGEN/LB COAL
	.5642	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4364 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	32.42	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	41.76	PERCENT

RUN NO. 325

SAMPLE NO. 3

DATE 1 -3 - 1980

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.153 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9984	LB/HR	COAL FED	619.0	GRAMS
HYDROGEN FLOW RATE	1.052	LB/HR	CHAR	298.0	GRAMS
HYDROGEN VELOCITY	1.135	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	825.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	825.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	36.72

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3310	3.529	5.929
CARBON DIOXIDE	.1500E-01	.1599	.4222
METHANE	1.630	17.34	16.68
ETHYLENE	0.	0.	0.
ETHANE	.4470	9.514	8.578
BENZENE	.9400E-01	6.007	4.690
TOLUENE	.2000E-02	.1491	.1177
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	18.80

TOTAL 36.70 55.22

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.16	7.35	0.	0.	0.	4.81
HYDROCARBON GASES	26.9	117.	0.	0.	0.	25.3
CARBON OXIDES	3.69	0.	18.1	0.	0.	6.35
WATER	0.	41.1	81.9	0.	0.	18.8
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	37.0

TOTAL 36.7 173. 100. 100. 100. 95.1

HYDROGEN CONSUMPTION- .3033E-01 LB HYDROGEN/LB COAL
.6137 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4092 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 36.70 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 45.88 PERCENT

RUN NO. 325

SAMPLE NO. 4

DATE 1 -3 -1980

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.128	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9984	LB/HR	COAL FED	619.0	GRAMS
HYDROGEN FLOW RATE	1.052	LB/HR	CHAR	298.0	GRAMS
HYDROGEN VELOCITY	1.161	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	850.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	850.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	500.0	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	36.72

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3160	3.369	5.660
CARBON DIOXIDE	.8000E-02	.8530E-01	.2252
METHANE	1.823	19.39	18.66
ETHYLENE	0.	0.	0.
ETHANE	.4020	8.556	7.715
BENZENE	.1100	7.030	5.489
TOLUENE	.1000E-02	.7455E-01	.5885E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	19.14

TOTAL	38.51	56.94
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.10	8.47	0.	0.	0.	5.55
HYDROCARBON GASES	27.9	123.	0.	0.	0.	26.4
CARBON OXIDES	3.45	0.	16.6	0.	0.	5.89
WATER	0.	41.9	83.4	0.	0.	19.1
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	37.0

TOTAL	38.5	181.	100.	100.	100.	96.8
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HYDROGEN CONSUMPTION-	.3376E-01	LB HYDROGEN/LB COAL
	.6831	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4153	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	38.51	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.84	PERCENT

RUN NO. 326

SAMPLE NO. 1

DATE 1 -4 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.577	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7498	LB/HR	COAL FED	1346.	GRAMS
HYDROGEN FLOW RATE	1.074	LB/HR	CHAR	890.0	GRAMS
HYDROGEN VELOCITY	.5346	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	740.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	16.33

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1800	2.249	4.045
CARBON DIOXIDE	.3400E-01	.4248	1.201
METHANE	.4910	6.121	6.305
ETHYLENE	0.	0.	0.
ETHANE	.1110	2.768	2.673
BENZENE	.1100E-01	.8237	.6887
TOLUENE	.2000E-02	.1747	.1477
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	9.156
TOTAL		12.56	24.22

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.998	1.18	0.	0.	0.	.836
HYDROCARBON GASES	8.89	37.9	0.	0.	0.	8.98
CARBON OXIDES	2.67	0.	28.1	0.	0.	5.25
WATER	0.	18.1	71.9	0.	0.	9.16
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
LAHAK	0.	0.	0.	0.	0.	62.0
TOTAL	12.6	67.5	100.	100.	100.	92.8

HYDROGEN CONSUMPTION-	-.1627E-01	LB HYDROGEN/LB COAL
	-.2838	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.1575	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	12.56	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	16.34	PERCENT

RUN NO. 326

SAMPLE NO. 2

DATE 1 -4 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.113	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.7498	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.074	LB/HR	COAL FED	1346.	GRAMS
HYDROGEN VELOCITY	.5663	FT/SEC	CHAR	890.0	GRAMS
REACTOR TEMP.	800.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

COAL ANALYSIS, %

CHAR ANALYSIS, %

CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	16.33

PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
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CARBON MONOXIDE	.1100	1.374	2.472
CARBON DIOXIDE	0.	0.	0.
METHANE	1.350	16.83	17.34
ETHYLENE	0.	0.	0.
ETHANE	.2370	5.911	5.707
BENZENE	.5500E-01	4.119	3.443
TOLUENE	.2000E-02	.1747	.1477
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	11.15

TOTAL	28.41	40.26
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.29	4.99	0.	0.	0.	3.59
HYDROCARBON GASES	22.7	98.2	0.	0.	0.	23.0
CARBON OXIDES	1.37	0.	12.5	0.	0.	2.47
WATER	0.	22.1	87.5	0.	0.	11.1
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	62.0

TOTAL	28.4	136.	100.	100.	100.	109.
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HYDROGEN CONSUMPTION-	.1777E-01	LB HYDROGEN/LB COAL
	.3100	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2496 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	28.41	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	44.48	PERCENT

RUN NO. 326 SAMPLE NO. 3 DATE 1 -4 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN LIMESTONE

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.618 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.7498	LB/HR	COAL FED	1346.	GRAMS
HYDROGEN FLOW RATE	1.074	LB/HR	CHAR	890.0	GRAMS
HYDROGEN VELOCITY	.5927	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	850.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	750.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	16.33

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3240	4.048	7.281
CARBON DIOXIDE	.1500E-01	.1874	.5297
METHANE	2.071	25.82	26.60
ETHYLENE	0.	0.	0.
ETHANE	.2470	6.160	5.947
BENZENE	.1080	8.088	6.761
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	7.626
TOTAL		44.30	54.74

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.09	9.34	0.	0.	0.	6.76
HYDROCARBON GASES	32.0	141.	0.	0.	0.	32.5
CARBON OXIDES	4.24	0.	40.1	0.	0.	7.81
WATER	0.	15.1	59.9	0.	0.	7.63
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	62.0
TOTAL	44.3	175.	100.	100.	100.	123.

HYDROGEN CONSUMPTION- .3765E-01 LB HYDROGEN/LB COAL
.6566 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -4.2404 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 44.30 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 65.82 PERCENT

RUN NO. 327 SAMPLE NO. 1 DATE 1 -8 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 1.543 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.026	LB/HR	COAL FED	1301.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	1085.	GRAMS
HYDROGEN VELOCITY	.6009	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	12.95

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1970	1.746	3.140
CARBON DIOXIDE	.3100E-01	.2747	.7764
METHANE	1.108	9.795	10.09
ETHYLENE	0.	0.	0.
ETHANE	.2860	5.059	4.884
BENZENE	.6400E-01	3.399	2.841
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	10.09
TOTAL		20.27	31.82

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.40	3.92	0.	0.	0.	2.84
HYDROCARBON GASES	14.9	62.8	0.	0.	0.	15.0
CARBON OXIDES	2.02	0.	20.8	0.	0.	3.92
WATER	0.	20.0	79.2	0.	0.	10.1
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	81.4
TOTAL	20.3	96.9	100.	100.	100.	120.

HYDROGEN CONSUMPTION- -.1529E-02 LB HYDROGEN/LB COAL
-.2667E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.1644 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 20.27 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 29.59 PERCENT

RUN NO. 327

SAMPLE NO. 2

DATE 1 -8 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.086	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.026	LB/HR	COAL FED	1301.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	1085.	GRAMS
HYDROGEN VELOCITY	.6009	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	12.95

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1350	1.196	2.152
CARBON DIOXIDE	0.	0.	0.
METHANE	2.927	25.88	26.66
ETHYLENE	0.	0.	0.
ETHANE	.8200E-01	1.450	1.400
BENZENE	.1760	9.347	7.814
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	11.36

TOTAL	37.87	49.38
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.35	10.8	0.	0.	0.	7.81
HYDROCARBON GASES	27.3	125.	0.	0.	0.	28.1
CARBON OXIDES	1.20	0.	10.9	0.	0.	2.15
WATER	0.	22.5	89.1	0.	0.	11.4
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	81.4
TOTAL	37.9	168.	100.	100.	100.	107.

HYDROGEN CONSUMPTION-	.3405E-01	LB HYDROGEN/LB COAL
	.5939	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2668 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	37.87	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	60.10	PERCENT

RUN NO. 327

SAMPLE NO. 3

DATE 1 -8 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.629 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.026	LB/HR	COAL FED	1301.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	1085.	GRAMS
HYDROGEN VELOCITY	1.6009	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	12.95

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3240	2.871	5.164
CARBON DIOXIDE	.1200E-01	.1063	.3005
METHANE	3.083	27.26	28.08
ETHYLENE	0.	0.	0.
ETHANE	.4100E-01	.7252	.7001
BENZENE	.1750	9.294	7.770
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	9.174
TOTAL		40.25	51.19

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.29	10.7	0.	0.	0.	7.77
HYDROCARBON GASES	28.0	128.	0.	0.	0.	28.8
CARBON OXIDES	2.98	0.	28.0	0.	0.	5.46
WATER	0.	18.2	72.0	0.	0.	9.17
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	81.4
TOTAL	40.3	168.	100.	100.	100.	139.

HYDROGEN CONSUMPTION- .3379E-01 LB HYDROGEN/LB COAL
.5893 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2431 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 40.25 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 61.41 PERCENT

RUN NO. 327

SAMPLE NO. 4

DATE 1 -8 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 6.172 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.026	LB/HR	COAL FED	1301.	GRAMS
HYDROGEN FLOW RATE	1.042	LB/HR	CHAR	1085.	GRAMS
HYDROGEN VELOCITY	.6009	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED MTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	12.95

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3060	2.711	4.877
CARBON DIOXIDE	.3700E-01	.3279	.9267
METHANE	3.100	27.41	28.23
ETHYLENE	0.	0.	0.
ETHANE	.4100E-01	.7252	.7001
BENZENE	.1270	6.745	5.639
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	8.846
TOTAL		37.91	49.22

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.74	7.79	0.	0.	0.	5.64
HYDROCARBON GASES	28.1	129.	0.	0.	0.	28.9
CARBON OXIDES	3.04	0.	30.6	0.	0.	5.80
WATER	0.	17.5	69.4	0.	0.	8.85
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.00
CHAR	0.	0.	0.	0.	0.	81.4
TOTAL	37.9	165.	100.	100.	100.	137.

HYDROGEN CONSUMPTION- .3234E-01 LB HYDROGEN/LB COAL
.5640 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2594 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 37.91 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 58.67 PERCENT

RUN NO. 328

SAMPLE NO. 1

DATE 1 -9 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.524	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED MTS.		
COAL FEED RATE	.9442	LB/HR	COAL FED	1161.	GRAMS
HYDROGEN FLOW RATE	1.071	LB/HR	CHAR	894.0	GRAMS
HYDROGEN VELOCITY	.6172	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	14.03

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1540	1.523	2.740
CARBON DIOXIDE	.8000E-02	.7915E-01	.2237
METHANE	1.275	12.58	12.96
ETHYLENE	0.	0.	0.
ETHANE	.2560	5.055	4.881
BENZENE	.7100E-01	4.210	3.519
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	10.79
TOTAL		23.45	35.12

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.21	4.86	0.	0.	0.	3.52
HYDROCARBON GASES	17.6	75.6	0.	0.	0.	17.8
CARBON OXIDES	1.60	0.	15.3	0.	0.	2.96
WATER	0.	21.4	84.7	0.	0.	10.8
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	74.2
TOTAL	23.5	112.	100.	100.	100.	116.

HYDROGEN CONSUMPTION-	.6077E-02	LB HYDROGEN/LB COAL
	.1060	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.1894 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	23.45	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	35.59	PERCENT

RUN NO. 328 SAMPLE NO. 2 DATE 1 -9 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.048 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9442	LB/HR	COAL FED	1161.	GRAMS
HYDROGEN FLOW RATE	1.071	LB/HR	CHAR	894.0	GRAMS
HYDROGEN VELOCITY	.6172	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	14.03

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1810	1.791	3.221
CARBON DIOXIDE	0.	0.	0.
METHANE	2.766	27.30	28.13
ETHYLENE	0.	0.	0.
ETHANE	.8000E-01	1.580	1.525
BENZENE	.1480	8.775	7.336
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	10.67
TOTAL		39.45	50.88

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.78	10.1	0.	0.	0.	7.34
HYDROCARBON GASES	28.9	132.	0.	0.	0.	29.7
CARBON OXIDES	1.79	0.	16.2	0.	0.	3.22
WATER	0.	21.1	83.8	0.	0.	10.7
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	74.2
TOTAL	39.4	173.	100.	100.	100.	132.

HYDROGEN CONSUMPTION- .3655E-01 LB HYDROGEN/LB COAL
.6375 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2709 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 39.45 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 62.20 PERCENT

RUN NO. 328

SAMPLE NO. 3

DATE 1 -9 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.572 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9442	LB/HR	COAL FED	1161.	GRAMS
HYDROGEN FLOW RATE	1.071	LB/HR	CHAR	894.0	GRAMS
HYDROGEN VELOCITY	.6172	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	900.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	14.03

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3280	3.245	5.837
CARBON DIOXIDE	.1000E-01	.9894E-01	.2796
METHANE	3.066	30.26	31.18
ETHYLENE	0.	0.	0.
ETHANE	.4000E-01	.7899	.7626
BENZENE	.1650	9.783	8.179
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	8.759
TOTAL		44.18	54.99

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.78	11.3	0.	0.	0.	8.18
HYDROCARBON GASES	31.1	143.	0.	0.	0.	31.9
CARBON OXIDES	3.34	0.	31.2	0.	0.	6.12
WATER	0.	17.4	68.8	0.	0.	8.76
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	74.2
TOTAL	44.2	181.	100.	100.	100.	136.

HYDROGEN CONSUMPTION- .4071E-01 LB HYDROGEN/LB COAL
.7101 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2586 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 44.18 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 67.52 PERCENT

RUN NO. 328

SAMPLE NO. 4

DATE 1 -9 - 1980

COAL TYPE- BATTELLE ILLINOIS #6 40% IN SAND

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.095	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9442	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.071	LB/HR	COAL FED	1161.	GRAMS
HYDROGEN VELOCITY	.6172	FT/SEC	CHAR	894.0	GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI	WATER	0.	GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	68.80	0.
HYDROGEN	5.000	0.
OXYGEN	10.10	0.
NITROGEN	1.200	0.
SULFUR	4.100	0.
ASH	10.80	14.03

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2960	2.928	5.267
CARBON DIOXIDE	.2700E-01	.2671	.7550
METHANE	2.480	24.48	25.22
ETHYLENE	0.	0.	0.
ETHANE	.6000E-01	1.185	1.144
BENZENE	.1180	6.997	5.849
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	8.736
TOTAL		35.85	46.97

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.00	8.08	0.	0.	0.	5.85
HYDROCARBON GASES	25.7	117.	0.	0.	0.	26.4
CARBON OXIDES	3.20	0.	31.4	0.	0.	6.02
WATER	0.	17.3	68.6	0.	0.	8.74
AMMONIA	0.	5.14	0.	100.	0.	1.63
HYDROGEN SULFIDE	0.	5.13	0.	0.	100.	4.88
CHAR	0.	0.	0.	0.	0.	74.2
TOTAL	35.9	153.	100.	100.	100.	128.

HYDROGEN CONSUMPTION-	.2641E-01	LB HYDROGEN/LB COAL
	.4606	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.2316 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	35.85	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	54.38	PERCENT

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