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MASTER

FLASH HYDROLYSIS OF COAL

QUARTERLY REPORT NO. 8
JANUARY 1 - MARCH 31, 1979

June 1979

PROCESS SCIENCES DIVISION
DEPARTMENT OF ENERGY & ENVIRONMENT

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(Coal Conversion and Utilization-
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June 1979

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(see references)

PROCESS SCIENCES DIVISION
DEPARTMENT OF ENERGY & ENVIRONMENT

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UPTON, NEW YORK 11973

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SUMMARY

The parametric study of the flash hydrolysis of sub-bituminous coal is in progress. 35 successful experiments have been completed to date. BTX (benzene, toluene, and xylene) yields from the coal have been found to be as high as 15% and the total liquid yields approximately 20%. Compared to lignite, the sub-bituminous coal produces a 50% greater amount of BTX with a much smaller yield of heavier liquids ($\geq C_9$). The total liquid yields were approximately the same in both cases and the composition of the heavier liquids was also similar. Maximum gaseous hydrocarbon yields produced at 2500 psi were also similar to that of lignite, 84 to 88%, except that at lower pressures the sub-bituminous proved to be more reactive, yielding 55% methane plus ethane at 1000 psi compared to 35% for the lignite.

A number of exploratory experiments were conducted using lignite ground to less than 55 microns and lignite impregnated with potassium carbonate (K_2CO_3). In one experiment, the finely ground lignite at 2500 psi and 750°C produced a higher yield of BTX than normal (14% vs 9%) but at some reduction in gaseous hydrocarbons (30% vs 40%). The purpose of impregnating the lignite with K_2CO_3 was to reduce the caking problems previously encountered at 4000 psi hydrogen pressure and to improve the low temperature ($< 800^\circ C$) conversion of this coal. Although only 2 experiments were conducted, the treatment did not appear to improve the yields.

The sulfur contained in the char remaining after reacting the lignite was determined to be approximately 95% in the form of organic sulfur. The sulfur in the original lignite is approximately 64% in the organic form.

It would appear that the particular organic form of sulfur in the lignite is able to survive extreme temperature ($\sim 900^{\circ}\text{C}$) at the short residence time it is subjected to in the FHP reactor. Extraction of this char with MEK, benzene and cyclohexane failed to produce any material that could be identified on a gas chromatograph at 230°C . The char extraction did yield a residue that represented 1% of the carbon in the feed lignite.

A report entitled, "Coal Conversion in Flash Hydropyrolysis Reactors", is being completed and will include the most recent modelling of the reaction scheme for the experimental data obtained on the FHP of North Dakota lignite.

I. OBJECTIVE AND SCOPE OF WORK

The program objective is to obtain process chemistry and design information on the Flash Hydropyrolysis Process (FHP), a rapid gas-phase non-catalytic coal hydrogenation technique being investigated at BNL.^(1,2) 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 to maximize liquid and/or gaseous yields and to complete mass balances of feed to product.

II. TUBULAR REACTOR EXPERIMENTAL RESULTS

Work Accomplished

a) Parametric Study Using New Mexico Sub-bituminous Coal

The parametric study of product yields at temperatures of 700° to 900°C and pressures from 1000 to 2500 psi using sub-bituminous coal is progressing. Previously reported initial problems with reactor and sample line plugging have been solved and a significant amount of information has been accumulated. An analysis of this coal plus the lignite studied is given in Table I. In Figure 1, the results of a series of 35 experiments are shown. The maximum yield of BTX is found to be as high as approximately 15% at 2000 to 2500 psi and decreases only to approximately 12% as the pressure is reduced to 1000 psi. Also, the temperatures at which maximum yields are obtained decrease with increased pressure, going from 825°C at 1000 psi to 775°C at 2500 psi. When these yields plus the gaseous hydrocarbons formed ($\text{CH}_4 + \text{C}_2\text{H}_6$) are compared to the same products from lignite

as shown in Figure 2, a constant incremental yield of approximately 5% in absolute yield for both the BTX and gaseous hydrocarbons is observed for the sub-bituminous coal. This results in an overall 10% increase in yield of hydrocarbon products for the sub-bituminous coal compared to the lignite. The yield of heavier liquid products ($\geq C_9$) from the sub-bituminous, although not completely investigated, appears to be much lower than that obtained from lignite, ranging from approximately 2 to 5%. When this is added to the maximum yields of BTX, however, the total liquid yield is on the average equal to or slightly greater than that from lignite.

At temperatures of 850°C and higher, the liquid hydrocarbons are seen to decompose almost entirely to produce gaseous hydrocarbons, principally methane and ethane. This plus the additional gaseous products formed directly from the coal result in the maximum gaseous yields shown in Figure 3. Although as previously mentioned, the study of the New Mexico sub-bituminous coal is still in progress, the information to date indicates it behaves similarly to lignite in gasification except that greater yields are obtained at lower pressure. At 1000 psi the lignite yields approximately 35% gaseous products and the sub-bituminous 55%, an almost 60% increase over the lignite. At 2500 psi, approximately the same yields (84 to 88%) were observed for both coals and the yields appear to be a direct function of the hydrogen pressure, increasing at a faster rate of 18% conversion for lignite and slower rate of 10% for sub-bituminous for each 500 psi increase in pressure. These yields were all produced at a hydrogen to coal feed ratio of approximately 1 lb/lb and at coal residence times between 2.4 and 7 seconds. It was found that at shorter residence times the reaction did not reach the completion and at longer

residence times, decomposition of the methane reduced the total conversion. Also, since higher temperatures accelerate the decomposition, the competing reactions of formation and decomposition at 2000 to 2500 psi result in the maximum yield frequently occurring at temperatures lower than the maximum studied (900°C). Table II gives the maximum yields observed to date using the sub-bituminous coal for both the liquefaction and gasification studies.

Also of interest is that in most of the experiments there was little or no oxides of carbon formed when using the sub-bituminous coal. This compares to significant amounts of carbon oxides formed when using lignite.

b) Effect of Particle Size on Yields from Lignite

It was previously reported that lignite particles of less than 55 microns ($< 55\mu$) could not be fed to the reactor system and that $< 87\mu$ particles showed little difference in yields as compared to $< 150\mu$. These smaller particles have been successfully fed to the reactor after modifying the feeder and the results are given in Table III. In the first experiment, run 201, conducted at 750°C and 1500 psi, the only difference in product yield from experiments using the normal coal grind ($< 150\mu$) appears to be a slight increase in the BTX yield and a decrease in the yield of heavier liquids ($\geq \text{C}_9$). In the second experiment, run 228, conducted at the same temperature and 2500 psi, the difference in product yield as compared to $< 150\mu$ particles is more pronounced. With the $< 150\mu$ particles, the gaseous hydrocarbon yields are generally greater than 40% while the $< 55\mu$ particles yielded only approximately 30%. Also, the larger particles usually produce liquid yields of approximately 9% BTX and heavier liquids, while with the $< 55\mu$ particles these yields were approximately 14% for

the BTX and 3% for the heavier liquids, giving almost the same total liquid yield.

c) Product Yield from Potassium Carbonate Treated Lignite

In Table IV, the results are shown for two experiments conducted using North Dakota lignite impregnated with 15 wt% K_2CO_3 . Impregnation was accomplished by thoroughly wetting the ground coal with a solution of K_2CO_3 , drying the coal in a vacuum oven at $70^{\circ}C$ to constant weight and then re-sieving the coal. The reasons for those experiments were two fold: (1) to try to reduce the caking quality of the lignite at elevated pressures (≈ 4000 psi) where previous experiments indicated caking which resulted in a plugged reactor, (2) to try to increase the low temperature ($< 800^{\circ}C$) gasification quality of the lignite. Neither experiment was a success. In the first, conducted at $750^{\circ}C$ and 4000 psi, the reactor plugged as previously, and, although the yield of gaseous hydrocarbons was approximately the same as observed in short term experiments using untreated lignite ($\approx 65\%$), the yield of BTX was considerably less (6.6% vs 16%). In the second experiment, conducted at $750^{\circ}C$ and 2500 psi, none of the yields were as high as normally obtained from the untreated lignite.

Work Forecast

The parametric study of the sub-bituminous coal will continue and will include the effect on conversion of low hydrogen to coal feed ratio. Other treated coals will be used, including calcium treated Illinois No. 6 supplied by both Battelle Columbus Laboratories and the Institute of Gas Technology. A further investigation will be made of the two other feed gases $CO-H_2$ and CH_4 , previously tried, in which the results were found

to be inconclusive.

III. PRODUCT ANALYSES AND MATERIAL BALANCES

Work Accomplished

a) Heavy Liquid Hydrocarbon Produced from New Mexico

Sub-bituminous Coal

The heavy liquid ($\geq C_9$) which is of molecular weight greater than BTX are collected at the end of each experiment and if a sufficient quantity is formed, it is analyzed and included in the total carbon balance as in Table I. As previously mentioned, the study of these products is still in progress. Although it presently appears the quantity of $\geq C_9$'s produced from sub-bituminous coal is less than half that produced from lignite, it also appears that the total liquids produced (BTX + $\geq C_9$) are approximately the same for both coals. Thus, the BTX is much higher for the sub-bituminous. The composition of these heavier liquids is also approximately the same for both coals, containing about 60% naphthalene and other two ring aromatics, the remainder being higher aromatic species.

b) Sulfur Balance

50 to 75% of the sulfur contained in the lignite fed to the FHP system is consistently found in the residual char. As shown in Table V, a detailed analysis of the lignite and char from run 177, 63.6% of the sulfur in the feed lignite is in the organic form as determined by the standard ASTM method for sulfur in coal. Using the same analytic method on the char, 50.3% of the sulfur is found in this by-product, 94.5% of which is in the organic form. This represents approximately 75% of the original organic sulfur in the feed lignite. Almost all the soluble and pyritic forms go into the effluent water produced and the gases vented to

the atmosphere, since little sulfur is found in the hydrocarbon products. In order for the organic sulfur to survive, it may be bound in the coal in a form capable of surviving temperatures as high as 900°C. The short residence time may also be a factor in maintaining the sulfur in the organic form in the char.

c) Extraction of Lignite Char

Three samples of char from an experiment conducted using lignite were extracted with methyl ethyl ketone (MEK) benzene and cyclohexane. In each extraction, the solution exhibited a yellow-green fluorescence and upon injection into a gas chromatograph at 230°C, no peaks were observed except for the solvent, implying the extracted material to consist of high molecular weight compounds. The MEK extract was evaporated and the residue weighed. It was determined to represent approximately 1% of the carbon in the feed lignite. The other samples were not evaporated since the MEK was considered to be the stronger solvent.

Work Forecast

An investigation is underway that may allow a more detailed determination of the sulfur and nitrogen compound not presently measured. For example, the possible presence of COS, SO₂, and NO_x in the gaseous effluent. One method being investigated is the addition of a high temperature photoionization detector to the present on-line process gas chromatograph.

IV. REACTION MODELLING AND DATA CORRELATION

Work Accomplished

A report entitled, "Coal Conversion in Flash Hydropyrolysis Reactors"³ is being completed for presentation at the AIChE 87th National Meeting, Boston, Massachusetts. The report will contain a correlation of the

data from experiments conducted at 1500, 2000, and 2500 psi, using preheated hydrogen and lignite. This information is used in the preliminary design of three types of reactors, a fluidized bed, a cocurrent down-flow entrained bed and a fast fluidized bed, all assuming a plant capacity of 25,000 ton/day.

Work Forecast

As soon as sufficient data becomes available from experiments using sub-bituminous coal, this data will be correlated in a similar manner as was done for the lignite data. Also, the present reaction model being used will be modified to more closely represent the actual reaction products observed.

V. EXPERIMENTAL EQUIPMENT AND MODIFICATIONS

Work Accomplished

No significant changes were made to the experimental equipment during this report period.

Work Forecast

Two improvements to the equipment are anticipated in the near future. A new coal feeder will be developed to allow the uniform feeding of almost any dry material of almost any particle size and the present char receiver will be enlarged to allow experiments of longer duration than is presently possible.

Also being investigated are methods to introduce steam into the feed gas and a method by which the reactor can be operated in a countercurrent mode.

VI. CONCLUSIONS

The following conclusions can be drawn from this work:

1. The maximum yield of BTX observed from the FHP of sub-bituminous coal is at least 50% greater than that from lignite (10% for lignite and 15% for sub-bituminous).

2. The total liquids yields ($\text{BTX} + \geq \text{C}_9$) are approximately the same for both coals ($\sim 20\%$).

3. Both types of coal can be hydrogasified to methane and ethane up to approximately 85% conversion of the carbon in the fuel at 2500 psi and 875° to 900°C .

4. The sub-bituminous coal yields 60% more gaseous hydrocarbons than the lignite at a pressure of 1000 psi and temperatures in the range of 875° to 900°C .

5. The gaseous yield from both coals is directly proportional to the hydrogen pressure in the range of 500 to 2500 psi.

6. A large part of the organic form of sulfur in the lignite appears to be preserved in the char product indicating a strong organic sulfur binding in lignite which is not affected by the severe conditions in the short residence time in the reactor.

7. A smaller particle size of coal tends to yield a larger amount of BTX and a smaller amount of heavy liquids; the overall yield remaining approximately the same.

8. Extraction of the lignite char indicated very low residual, solid heavy oils.

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TABLE I
ULTIMATE ANALYSIS (WT PCT DRY) OF COALS USED IN STUDIES

	North Dakota Lignite	New Mexico Sub-bituminous
Carbon	59.0	59.3
Hydrogen	4.0	4.2
Oxygen*	25.5	16.8
Nitrogen	0.9	1.2
Sulfur	0.6	0.8
Ash	10.0	17.7

*By difference.

TABLE II
MAXIMUM YIELDS FROM THE FLASH HYDROPYROLYSIS
OF NEW MEXICO SUB-BITUMINOUS COAL

	<u>LIQUIDS</u>	<u>GASES</u>
Run No.	244	241
Date	4/3/79	3/22/79
Reactor Temperature ($^{\circ}\text{C}$)	725	900
Reactor Pressure (psi)	2000	2500
H ₂ Feed Rate (lb/hr)	0.93	0.95
Coal Feed Rate (lb/hr)	1.03	1.03
Residence Time (sec)	6.3	7.0
<u>Product Yields (% Carbon Converted)</u>		
CO	--	--
CH ₄	19.3	83.6
C ₂ H ₆	<u>5.1</u>	<u>--</u>
Total Gas HC	24.4	83.6
BTX	15.2	--
$\geq \text{C}_9$	<u>4.5</u>	<u>--</u>
Total Liquids	19.7	--
Total	44.1	83.6

TABLE III

PRODUCT YIELDS FROM < 55 μ LIGNITE PARTICLES

Run No.	201	228
Date	11/16/78	2/20/79
Reactor Temperature ($^{\circ}$ C)	725	750
Reactor Pressure (psi)	1500	2500
H ₂ Feed Rate (lb/hr)	0.93	1.01
Coal Feed Rate (lb/hr)	0.97	1.00
Residence Time (sec)	11.5	17.0
<u>Product Yields (% Carbon Converted)</u>		
CO	5.9	1.2
CH ₄	16.4	20.3
C ₂ H ₆	<u>8.1</u>	<u>9.3</u>
Total Gas HC	25.1	29.6
BTX	9.2	13.8
$\geq$ C ₉	<u>4.0</u>	<u>2.8</u>
Total Liquid	13.2	16.6
Total	44.2	47.4

TABLE IV

PRODUCT YIELDS FROM NORTH DAKOTA LIGNITE
TREATED WITH 15 WT% K_2CO_3

Run No.	224	227
Date	2/1/79	2/9/79
Reactor Temperature ($^{\circ}C$)	750	750
Reactor Pressure (psi)	4000	2500
H ₂ Feed Rate (lb/hr)	1.1	0.9
Coal Feed Rate (lb/hr)	1.0	1.1
Residence Time (sec)	10.7	7.0
<u>Product Yields (% Carbon Converted)</u>		
CO	--	--
CH ₄	55.0	23.4
C ₂ H ₆	<u>9.0</u>	<u>11.3</u>
Total Gas HC	64.0	34.7
BTX	6.6	6.1
$\geq C_9$	<u>*</u>	<u>2.8</u>
Total Liquid	6.6	8.9
Total	70.6	43.6

*Insufficient sample--reactor plugged.

TABLE V

SULFUR DISTRIBUTION IN NORTH DAKOTA LIGNITE AND LIGNITE CHAR

Run No. 177
 Reactor Temperature - 875°C
 System Pressure - 2500 psi
 Max Product Yield - 82.6% Methane

Form of Sulfur	LIGNITE		CHAR		% of Totals from Lignite in Char
	% in Lignite	% of Total	% in Char	% of Total	
SO ₄ (soluble)	0.085	14.8	0.027	2.8	1.4
FeS ₂ (pyrite)	0.124	21.6	0.026	2.7	1.4
Organic*	<u>0.366</u>	<u>63.6</u>	<u>0.90</u>	<u>94.5</u>	<u>47.5</u>
Total	0.575	100.0	0.953	100.0	50.3

*By difference

Figure 1. Flash Hydropyrolysis of Sub-Bituminous Coal, Maximum BTX Yields vs Temperature, Pressure 1000 to 2500 psi.

Figure 2. Product Yields at Maximum Conversion to BTX, Fraction Carbon Converted vs Pressure, Temperature 750°-800°C.

Figure 3. Maximum Gaseous Hydrocarbon Yields vs System Pressure, Temperature 875°-900°C, Coal Residence Time 2.4-7.0 sec.

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APPENDIX

RUN NO. 223

SAMPLE NO. 1

DATE 1 -31 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	1.600	SECONDS
CALCULATED	1.800	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.135	LB/HR	COAL FED	704.0	GRAMS
HYDROGEN FLOW RATE	1.060	LB/HR	CHAR	347.0	GRAMS
HYDROGEN VELOCITY	.3553	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.0100	0.
ASH	17.60	25.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.3300	3.095	2.978
ETHYLENE	0.	0.	0.
ETHANE	.1000	1.876	1.692
BENZENE	.2000E-01	1.127	.8798
TOLUENE	.5000E-02	.3286	.2594
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	6.427	5.809
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.46	1.79	0.	0.	0.	1.14
HYDROCARBON GASES	4.97	21.4	0.	0.	0.	4.67
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	38.4
TOTAL	6.43	30.7	0.	100.	100.	47.1

HYDROGEN CONSUMPTION-	-.2895E-01	LB HYDROGEN/LB COAL
	-.5858	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3845	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	6.427	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	8.484	PERCENT

RUN NO. 223

SAMPLE NO. 2

DATE 1 -31- 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	3.200	SECONDS
CALCULATED	3.600	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.135	LB/HR	COAL FED	704.0	GRAMS
HYDROGEN FLOW RATE	1.060	LB/HR	CHAR	347.0	GRAMS
HYDROGEN VELOCITY	.3553	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	35.87

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1500	1.410	2.369
CARBON DIOXIDE	0.	0.	0.
METHANE	1.550	14.54	13.99
ETHYLENE	0.	0.	0.
ETHANE	.5400	10.13	9.136
BENZENE	.1050	5.916	4.619
TOLUENE	.1100E-01	.7230	.5707
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		32.72	30.68

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.64	8.02	0.	0.	0.	5.19
HYDROCARBON GASES	24.7	105.	0.	0.	0.	23.1
CARBON OXIDES	1.41	0.	6.63	0.	0.	2.37
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.	38.4
TOTAL	32.7	121.	6.63	100.	100.	71.9

HYDROGEN CONSUMPTION-	.8754E-02	LB HYDROGEN/LB COAL
	.1771	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4416 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	32.72	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.25	PERCENT

RUN NO. 223

SAMPLE NO. 3

DATE 1 -31 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	4.800	SECONDS
CALCULATED	5.400	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.135	LB/HR	COAL FED	704.0	GRAMS
HYDROGEN FLOW RATE	1.060	LB/HR	CHAR	347.0	GRAMS
HYDROGEN VELOCITY	.3553	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.100	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	35.87

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1840	1.730	2.906
CARBON DIOXIDE	0.	0.	0.
METHANE	1.720	16.13	15.52
ETHYLENE	0.	0.	0.
ETHANE	.6000	11.26	10.15
BENZENE	.1470	8.282	6.466
TOLUENE	.6000E-02	.3943	.3113
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		37.79	35.35

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.68	10.4	0.	0.	0.	6.78
HYDROCARBON GASES	27.4	117.	0.	0.	0.	25.7
CARBON OXIDES	1.73	0.	8.13	0.	0.	2.91
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.	38.4
TOTAL	37.8	135.	8.13	100.	100.	76.6

HYDROGEN CONSUMPTION-	.1460E-01	LB HYDROGEN/LB COAL
	.2954	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4395 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	37.79	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.65	PERCENT

RUN NO. 223

SAMPLE NO. 4

DATE 1 -31 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	6.400	SECONDS
CALCULATED	7.200	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.135	LB/HR	COAL FED	704.0	GRAMS
HYDROGEN FLOW RATE	1.060	LB/HR	CHAR	347.0	GRAMS
HYDROGEN VELOCITY	.3553	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	35.87

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2160	2.030	3.411
CARBON DIOXIDE	0.	0.	0.
METHANE	1.900	17.82	17.14
ETHYLENE	0.	0.	0.
ETHANE	.6500	12.20	11.00
BENZENE	.1600	9.014	7.038
TOLUENE	.4000E-02	.2629	.2075
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		41.32	38.80

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.28	11.1	0.	0.	0.	7.25
HYDROCARBON GASES	30.0	128.	0.	0.	0.	28.1
CARBON OXIDES	2.03	0.	9.55	0.	0.	3.41
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.	38.4
TOTAL	41.3	147.	9.55	100.	100.	80.1

HYDROGEN CONSUMPTION-	.1965E-01	LB HYDROGEN/LB COAL
	.3976	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4456	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	41.32	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	53.28	PERCENT

RUN NO. 224

SAMPLE NO. 1

DATE 2 -1 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE TREATED W/15% K₂CO₃

COAL RESIDENCE TIME-MEASURED 12.80 SECONDS
CALCULATED 10.70 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9997	LB/HR	COAL FED	221.0	GRAMS
HYDROGEN FLOW RATE	1.120	LB/HR	CHAR	90.00	GRAMS
HYDROGEN VELOCITY	.1408	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	4000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	52.00	0.
HYDROGEN	3.310	0.
OXYGEN	21.50	0.
NITROGEN	.8200	0.
SULFUR	.5000	0.
ASH	8.830	21.68

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	4.290	55.02	41.91
ETHYLENE	0.	0.	0.
ETHANE	.3500	8.981	6.412
BENZENE	.8600E-01	6.626	4.096
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		70.63	52.42

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.63	8.73	0.	0.	0.	4.10
HYDROCARBON GASES	64.0	326.	0.	0.	0.	48.3
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.31	0.	100.	0.	1.09
HYDROGEN SULFIDE	0.	.944	0.	0.	100.	.583
CHAR	0.	0.	0.	0.	0.	35.0

TOTAL	70.6	341.	0.	100.	100.	89.1
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HYDROGEN CONSUMPTION- .7964E-01 LB HYDROGEN/LB COAL
1.838 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8079 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 59.88 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 77.72 PERCENT

RUN NO. 225

SAMPLE NO. 1

DATE 2 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	1.030	SECONDS
CALCULATED	1.530	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	310.0	GRAMS
HYDROGEN VELOCITY	.5431	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	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	34.22

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6000E-01	.6155	1.034
CARBON DIOXIDE	0.	0.	0.
METHANE	.2350	2.405	2.314
ETHYLENE	0.	0.	0.
ETHANE	.9700E-01	1.986	1.791
BENZENE	.8000E-02	.4919	.3841
TOLUENE	.5000E-02	.3586	.2831
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		5.858	5.807

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.851	1.07	0.	0.	0.	.667
HYDROCARBON GASES	4.39	18.5	0.	0.	0.	4.11
CARBON OXIDES	.616	0.	2.89	0.	0.	1.03
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.	41.3
TOTAL	5.86	27.1	2.89	100.	100.	50.0

HYDROGEN CONSUMPTION-	-.3046E-01	LB HYDROGEN/LB COAL
	-.6163	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3725	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	5.858	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	6.909	PERCENT

RUN NO. 225

SAMPLE NO. 2

DATE 2 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	2.050	SECONDS
CALCULATED	3.060	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	310.0	GRAMS
HYDROGEN VELOCITY	.5431	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1000.	PSI			

TOTAL ACCUMULATED MTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	10.00	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	34.22

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1400	1.436	2.413
CARBON DIOXIDE	0.	0.	0.
METHANE	1.200	12.28	11.82
ETHYLENE	0.	0.	0.
ETHANE	.4500	9.215	8.309
BENZENE	.5600E-01	3.443	2.688
TOLUENE	.1500E-01	1.076	.8494
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		27.45	26.08

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.52	5.56	0.	0.	0.	3.54
HYDROCARBON GASES	21.5	91.4	0.	0.	0.	20.1
CARBON OXIDES	1.44	0.	6.75	0.	0.	2.41
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.	41.3
TOTAL	27.5	104.	6.75	100.	100.	70.2

HYDROGEN CONSUMPTION-	.1869E-02	LB HYDROGEN/LB COAL
	.3782E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4341 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	27.45	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	34.99	PERCENT

RUN NO. 225

SAMPLE NO. 3

DATE 2 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	3.080	SECONDS
CALCULATED	4.590	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	310.0	GRAMS
HYDROGEN VELOCITY	.5431	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	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	34.22

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1750	1.795	3.016
CARBON DIOXIDE	0.	0.	0.
METHANE	1.310	13.41	12.90
ETHYLENE	0.	0.	0.
ETHANE	.5000	10.24	9.232
BENZENE	.7500E-01	4.611	3.601
TOLUENE	.1200E-01	.8607	.6795
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		30.91	29.43

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.47	6.66	0.	0.	0.	4.28
HYDROCARBON GASES	23.6	100.	0.	0.	0.	22.1
CARBON OXIDES	1.80	0.	8.44	0.	0.	3.02
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.	41.3
TOTAL	30.9	115.	8.44	100.	100.	73.6

HYDROGEN CONSUMPTION-	.6097E-02	LB HYDROGEN/LB COAL
	.1234	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4334	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	30.91	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	39.30	PERCENT

RUN NO. 225

SAMPLE NO. 4

DATE 2 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	4.100	SECONDS
CALCULATED	6.120	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	310.0	GRAMS
HYDROGEN VELOCITY	.5431	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	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	34.22

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2000	2.052	3.447
CARBON DIOXIDE	0.	0.	0.
METHANE	1.320	13.51	13.00
ETHYLENE	0.	0.	0.
ETHANE	.5200	10.65	9.602
BENZENE	.7500E-01	4.611	3.601
TOLUENE	.8000E-02	.5738	.4530
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		31.40	30.10

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.19	6.27	0.	0.	0.	4.05
HYDROCARBON GASES	24.2	102.	0.	0.	0.	22.6
CARBON OXIDES	2.05	0.	9.65	0.	0.	3.45
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.	41.3
TOTAL	31.4	116.	9.65	100.	100.	74.2

HYDROGEN CONSUMPTION-	.6749E-02	LB HYDROGEN/LB COAL
	.1366	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4311 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	31.40	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	40.01	PERCENT

DATE 2 -9 - 1979

COAL RESIDENCE TIME-MEASURED	.9000	SECONDS
CALCULATED	2.300	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.090	LB/HR	COAL FED	727.4	GRAMS
HYDROGEN FLOW RATE	.9400	LB/HR	CHAR	399.3	GRAMS
HYDROGEN VELOCITY	.1830	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

	COAL ANALYSIS,%	CHAR ANALYSIS,%
CARBON	52.00	0.
HYDROGEN	3.310	0.
OXYGEN	21.50	0.
NITROGEN	.8200	0.
SULFUR	.5000	0.
ASH	8.830	16.09

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1720	1.702	2.264
CARBON DIOXIDE	0.	0.	0.
METHANE	.7770	7.673	5.846
ETHYLENE	0.	0.	0.
ETHANE	.1160	2.292	1.636
BENZENE	.1740E-01	1.032	.6382
TOLUENE	.5000E-02	.3460	.2163
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		13.05	10.60

CARBON HYDROGEN OXYGEN NITROGEN SULFUR MAE COAL

LIQUIDS	1.38	1.88	0.	0.	0.	.854
HYDROCARBON GASES	9.97	49.5	0.	0.	0.	7.48
CARBON OXIDES	1.70	0.	5.48	0.	0.	2.26
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.31	0.	100.	0.	1.09
HYDROGEN SULFIDE	0.	.944	0.	0.	100.	.583
CHAR	0.	0.	0.	0.	0.	50.5
TOTAL	13.0	57.7	5.48	100.	100.	62.8

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HEAT OF REACTION- -.4945 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	13.05	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	14.10	PERCENT

RUN NO. 227

SAMPLE NO. 2

DATE 2 -9 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE TREATED W/15% K₂CO₃

COAL RESIDENCE TIME-MEASURED	1.800	SECONDS
CALCULATED	4.640	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.090	LB/HR	COAL FED	727.4	GRAMS
HYDROGEN FLOW RATE	1.000	LB/HR	CHAR	399.3	GRAMS
HYDROGEN VELOCITY	.1830	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	52.00	0.
HYDROGEN	3.310	0.
OXYGEN	21.50	0.
NITROGEN	.8200	0.
SULFUR	.5000	0.
ASH	8.830	16.09

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.386	25.07	19.10
ETHYLENE	0.	0.	0.
ETHANE	.4480	9.417	6.723
BENZENE	.1030	6.501	4.019
TOLUENE	.4000E-02	.2945	.1841
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		41.28	30.02

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.80	9.01	0.	0.	0.	4.20
HYDROCARBON GASES	34.5	169.	0.	0.	0.	25.8
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.31	0.	100.	0.	1.00
HYDROGEN SULFIDE	0.	.944	0.	0.	100.	.583
CHAR	0.	0.	0.	0.	0.	50.5
TOTAL	41.3	185.	0.	100.	100.	82.2

HYDROGEN CONSUMPTION-	.2803E-01	LB HYDROGEN/LB COAL
	.6468	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6226 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	41.28	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	51.13	PERCENT

RUN NO. 227 SAMPLE NO. 3 DATE 2 -9 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE TREATED W/15% K2CO3

COAL RESIDENCE TIME-MEASURED 2.700 SECONDS
CALCULATED 6.960 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED MTS.		
COAL FEED RATE	1.090	LB/HR	COAL FED	727.4	GRAMS
HYDROGEN FLOW RATE	.8500	LB/HR	CHAR	399.3	GRAMS
HYDROGEN VELOCITY	.1830	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	52.00	0.
HYDROGEN	3.310	0.
OXYGEN	21.50	0.
NITROGEN	.8200	0.
SULFUR	.5000	0.
ASH	8.830	16.09

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.617	23.37	17.80
ETHYLENE	0.	0.	0.
ETHANE	.6340	11.33	8.087
BENZENE	.1120	6.008	3.714
TOLUENE	.1000E-02	.6258E-01	.3912E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		40.77	29.64

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.07	8.01	0.	0.	0.	3.75
HYDROCARBON GASES	34.7	168.	0.	0.	0.	25.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.31	0.	100.	0.	1.09
HYDROGEN SULFIDE	0.	.944	0.	0.	100.	.583
CHAR	0.	0.	0.	0.	0.	50.5
TOTAL	40.8	182.	0.	100.	100.	81.8

HYDROGEN CONSUMPTION- .2724E-01 LB HYDROGEN/LB COAL
 .6286 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6188 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 40.77 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 50.61 PERCENT

RUN NO. 227

SAMPLE NO. 4

DATE 2 -9 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE TREATED W/15% K₂CO₃

COAL RESIDENCE TIME-MEASURED 3.600 SECONDS
CALCULATED 9.280 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.090	LB/HR	COAL FED	727.4	GRAMS
HYDROGEN FLOW RATE	.8500	LB/HR	CHAR	399.3	GRAMS
HYDROGEN VELOCITY	.1830	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	52.00	0.
HYDROGEN	3.310	0.
OXYGEN	21.50	0.
NITROGEN	.8200	0.
SULFUR	.5000	0.
ASH	8.830	16.09

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	8.973	80.13	61.04
ETHYLENE	0.	0.	0.
ETHANE	.7960	14.22	10.15
BENZENE	.9000E-01	4.828	2.985
TOLUENE	.1000E-02	.6258E-01	.3912E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL 99.24 74.22

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.89	6.46	0.	0.	0.	3.02
HYDROCARBON GASES	94.4	479.	0.	0.	0.	71.2
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.31	0.	100.	0.	1.09
HYDROGEN SULFIDE	0.	.944	0.	0.	100.	.583
CHAR	0.	0.	0.	0.	0.	50.5
TOTAL	99.2	491.	0.	100.	100.	126.

HYDROGEN CONSUMPTION- .1296 LB HYDROGEN/LB COAL
2.990 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.9845 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 63.26 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 83.22 PERCENT

RUN NO. 228

SAMPLE NO. 1

DATE 2 -20 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE < 55 MICRON

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 5.660 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9958	LB/HR	COAL FED	677.7	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	112.7	GRAMS
HYDROGEN VELOCITY	.2044	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.80	0.
HYDROGEN	3.810	0.
OXYGEN	24.72	0.
NITROGEN	.9400	0.
SULFUR	.5800	0.
ASH	10.15	61.04

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAE COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1600	1.629	2.528
CARBON DIOXIDE	0.	0.	0.
METHANE	.5900	5.993	5.327
ETHYLENE	0.	0.	0.
ETHANE	.6900E-01	1.402	1.168
BENZENE	.2300E-01	1.403	1.012
TOLUENE	.1200E-01	.8542	.6230
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		11.28	10.66

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAE COAL
LIQUIDS	2.26	3.13	0.	0.	0.	1.64
HYDROCARBON GASES	7.39	37.1	0.	0.	0.	6.50
CARBON OXIDES	1.63	0.	5.25	0.	0.	2.53
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.29	0.	100.	0.	1.27
HYDROGEN SULFIDE	0.	.951	0.	0.	100.	.686
CHAR	0.	0.	0.	0.	0.	7.21

TOTAL	11.3	46.5	5.25	100.	100.	19.8
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HYDROGEN CONSUMPTION- -.2039E-01 LB HYDROGEN/LB COAL
-.4092 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6074 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 11.28 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 12.75 PERCENT

RUN NO. 228

SAMPLE NO. 2

DATE 2 -20 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE < 55 MICRON

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 11.32 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9958	LB/HR	COAL FED	677.7	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	112.7	GRAMS
HYDROGEN VELOCITY	.2044	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.80	0.
HYDROGEN	3.810	0.
OXYGEN	21.72	0.
NITROGEN	.9400	0.
SULFUR	.5000	0.
ASH	10.15	61.04

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1650	1.680	2.607
CARBON DIOXIDE	0.	0.	0.
METHANE	1.820	18.49	16.43
ETHYLENE	0.	0.	0.
ETHANE	.3700	7.519	6.264
BENZENE	.1800	10.98	7.923
TOLUENE	.9000E-02	.6406	.4672
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		39.31	33.69

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	11.6	15.4	0.	0.	0.	8.39
HYDROCARBON GASES	26.0	127.	0.	0.	0.	22.7
CARBON OXIDES	1.68	0.	5.41	0.	0.	2.61
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.29	0.	100.	0.	1.27
HYDROGEN SULFIDE	0.	.951	0.	0.	100.	.686
CHAR	0.	0.	0.	0.	0.	7.21
TOTAL	39.3	149.	5.41	100.	100.	42.9

HYDROGEN CONSUMPTION- .1858E-01 LB HYDROGEN/LB COAL
.3728 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6671 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 39.31 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 50.49 PERCENT

RUN NO. 228

SAMPLE NO. 3

DATE 2 -20 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE < 55 MICRON

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	16.98	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9958	LB/HR	COAL FED	677.7	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	112.7	GRAMS
HYDROGEN VELOCITY	.2044	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.80	0.
HYDROGEN	3.810	0.
OXYGEN	24.72	0.
NITROGEN	.9400	0.
SULFUR	.5800	0.
ASH	10.15	61.04

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1150	1.171	1.817
CARBON DIOXIDE	0.	0.	0.
METHANE	1.970	20.01	17.79
ETHYLENE	0.	0.	0.
ETHANE	.4500	9.144	7.618
BENZENE	.2200	13.42	9.684
TOLUENE	.3000E-02	.2135	.1557
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		43.96	37.06

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.6	18.0	0.	0.	0.	9.84
HYDROCARBON GASES	29.2	142.	0.	0.	0.	25.4
CARBON OXIDES	1.17	0.	3.77	0.	0.	1.82
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.29	0.	100.	0.	1.27
HYDROGEN SULFIDE	0.	.951	0.	0.	100.	.686
CHAR	0.	0.	0.	0.	0.	7.21
TOTAL	44.0	166.	3.77	100.	100.	46.2

HYDROGEN CONSUMPTION-	.2506E-01	LB HYDROGEN/LB COAL
	.5029	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -4.6798 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	43.96	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	57.58	PERCENT

RUN NO. 228

SAMPLE NO. 4

DATE 2 -20 - 1979

COAL TYPE- NORTH DAKOTA LIGNITE < 55 MICRON

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	22.64	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	.9958	LB/HR	COAL FED	677.7 GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	112.7 GRAMS
HYDROGEN VELOCITY	.2044	FT/SEC	LIGHT OILS	0. GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0. GRAMS
HYDROGEN PRESSURE	2500.	PSI		

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.80	0.
HYDROGEN	3.810	0.
OXYGEN	24.72	0.
NITROGEN	.9400	0.
SULFUR	.5800	0.
ASH	10.15	61.04

	PRODUCT COMPL. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.3700	3.767	5.846
CARBON DIOXIDE	0.	0.	0.
METHANE	1.830	18.59	16.52
ETHYLENE	0.	0.	0.
ETHANE	.4400	8.941	7.449
BENZENE	.2200	13.42	9.684
TOLUENE	.3000E-02	.2135	.1557
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		44.93	39.66

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.6	18.0	0.	0.	0.	9.84
HYDROCARBON GASES	27.5	133.	0.	0.	0.	24.0
CARBON OXIDES	3.77	0.	12.1	0.	0.	5.85
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	5.29	0.	100.	0.	1.27
HYDROGEN SULFIDE	0.	.951	0.	0.	100.	.686
CHAR	0.	0.	0.	0.	0.	7.21
TOTAL	44.9	157.	12.1	100.	100.	48.8

HYDROGEN CONSUMPTION-	.2190E-01	LB HYDROGEN/LB COAL
	.4395	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6247 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	44.93	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	55.08	PERCENT

RUN NO. 229

SAMPLE NO. 1

DATE 2 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
 CALCULATED 2.130 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.020	LB/HR	COAL FED	643.0	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	305.0	GRAMS
HYDROGEN VELOCITY	.2554	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	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	37.27

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.4850	4.852	4.668
ETHYLENE	0.	0.	0.
ETHANE	.2900E-01	.5804	.5233
BENZENE	.2600E-01	1.562	1.220
TOLUENE	.2000E-02	.1402	.1107
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		7.135	6.522

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.70	2.05	0.	0.	0.	1.33
HYDROCARBON GASES	5.43	25.2	0.	0.	0.	5.19
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	36.1

TOTAL	7.13	34.7	0.	100.	100.	45.5
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HYDROGEN CONSUMPTION- -.2728E-01 LB HYDROGEN/LB COAL
 -.5520 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3915 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 7.135 PERCENT
 EFFECTIVE ENERGY EFFICIENCY- 9.932 PERCENT

RUN NO. 229

SAMPLE NO. 2

DATE 2 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.260	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.020	LB/HR	COAL FED	643.0	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	305.0	GRAMS
HYDROGEN VELOCITY	.2554	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	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	37.27

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.640	16.41	15.78
ETHYLENE	0.	0.	0.
ETHANE	.4500	9.006	8.121
BENZENE	.1250	7.512	5.865
TOLUENE	.7000E-02	.4907	.3874
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		33.41	30.16

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.00	9.61	0.	0.	0.	6.25
HYDROCARBON GASES	25.4	110.	0.	0.	0.	23.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	36.1
TOTAL	33.4	127.	0.	100.	100.	69.2

HYDROGEN CONSUMPTION-	.1146E-01	LB HYDROGEN/LB COAL
	.2318	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4682	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	33.41	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	45.28	PERCENT

RUN NO. 229

SAMPLE NO. 3

DATE 2 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.390	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.020	LB/HR	COAL FED	643.0	GRAMS
HYDROGEN FLOW RATE	1.016	LB/HR	CHAR	305.0	GRAMS
HYDROGEN VELOCITY	.2554	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	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	37.27

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.820	18.21	17.52
ETHYLENE	0.	0.	0.
ETHANE	.4070	8.146	7.345
BENZENE	.1560	9.375	7.320
TOLUENE	.3000E-02	.2103	.1660
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		35.94	32.35

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.58	11.4	0.	0.	0.	7.49
HYDROCARBON GASES	26.1	116.	0.	0.	0.	24.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	36.1
TOTAL	35.9	135.	0.	100.	100.	71.4

HYDROGEN CONSUMPTION-	.1452E-01	LB HYDROGEN/LB COAL
	.2939	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4699	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	35.94	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.83	PERCENT

STOP

RUN NO. 230

SAMPLE NO. 1

DATE 2 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.530	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	.9984	LB/HR	COAL FED	702.2 GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	401.6 GRAMS
HYDROGEN VELOCITY	.5357	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	1000.	PSI		

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.9100	0.
ASH	17.68	30.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.6400	6.692	6.439
ETHYLENE	0.	0.	0.
ETHANE	.1330	2.782	2.509
BENZENE	.3900E-01	2.450	1.913
TOLUENE	.2000E-01	1.466	1.157
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		13.39	12.02

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.92	4.91	0.	0.	0.	3.07
HYDROCARBON GASES	9.47	41.8	0.	0.	0.	8.95
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	48.0
TOTAL	13.4	54.2	0.	100.	100.	62.9

HYDROGEN CONSUMPTION-	-.1913E-01	LB HYDROGEN/LB COAL
	-.3872	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4009	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	13.39	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	16.65	PERCENT

RUN NO. 230

SAMPLE NO. 2

DATE 2 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.050 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9984	LB/HR	COAL FED	702.2	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	401.6	GRAMS
HYDROGEN VELOCITY	.5357	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	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	30.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.180	12.34	11.87
ETHYLENE	0.	0.	0.
ETHANE	.2350	4.916	4.433
BENZENE	.1000	6.282	4.905
TOLUENE	.7000E-02	.5130	.4050
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		24.05	21.61

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.79	8.17	0.	0.	0.	5.31
HYDROCARBON GASES	17.3	76.3	0.	0.	0.	16.3
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	48.0
TOTAL	24.0	92.0	0.	100.	100.	72.5

HYDROGEN CONSUMPTION- -.3343E-02 LB HYDROGEN/LB COAL
-.6765E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4292 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 24.05 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 32.21 PERCENT

RUN NO. 230

SAMPLE NO. 3

DATE 2 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.580	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9984	LB/HR	COAL FED	702.2	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	401.6	GRAMS
HYDROGEN VELOCITY	.5357	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	1000.	PSI			

TOTAL ACCUMULATED WTS.

	COAL ANALYSIS: %	CHAR ANALYSIS: %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.00	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	30.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.280	13.38	12.88
ETHYLENE	0.	0.	0.
ETHANE	.2500	5.230	4.716
BENZENE	.1260	7.915	6.180
TOLUENE	.3000E-02	.2198	.1736
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		26.75	23.95

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.13	9.72	0.	0.	0.	6.35
HYDROCARBON GASES	18.6	82.4	0.	0.	0.	17.0
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	48.0
TOTAL	26.7	99.6	0.	100.	100.	74.8

HYDROGEN CONSUMPTION-	-.1476E-03	LB HYDROGEN/LB COAL
	-.2988E-02	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4299	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	26.75	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	35.93	PERCENT

RUN NO. 230

SAMPLE NO. 4

DATE 2 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.100	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9984	LB/HR	COAL FED	702.2	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	401.6	GRAMS
HYDROGEN VELOCITY	.5357	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	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	30.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.9600E-01	1.006	1.690
CARBON DIOXIDE	0.	0.	0.
METHANE	1.300	13.59	13.08
ETHYLENE	0.	0.	0.
ETHANE	.2200	4.603	4.150
BENZENE	.1230	7.726	6.033
TOLUENE	.2000E-02	.1466	.1157
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		27.08	25.07

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.87	9.40	0.	0.	0.	6.15
HYDROCARBON GASES	10.2	81.2	0.	0.	0.	17.2
CARBON OXIDES	1.01	0.	4.73	0.	0.	1.69
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.	48.0
TOTAL	27.1	98.1	4.73	100.	100.	75.9

HYDROGEN CONSUMPTION-	-.8037E-03	LB HYDROGEN/LB COAL
	-.1626E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4137 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	27.08	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	35.22	PERCENT

RUN NO. 231

SAMPLE NO. 1

DATE 2 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 2.430 SECONDS
CALCULATED 2.300 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8953	LB/HR	COAL FED	610.0	GRAMS
HYDROGEN FLOW RATE	.9650	LB/HR	CHAR	281.3	GRAMS
HYDROGEN VELOCITY	.1988	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	2500.	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	17.18	38.34

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.383	14.96	14.31
ETHYLENE	0.	0.	0.
ETHANE	.3550	7.685	6.888
BENZENE	.9300E-01	6.045	4.692
TOLUENE	.7000E-02	.5308	.4165
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		29.23	26.31

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.58	7.92	0.	0.	0.	5.11
HYDROCARBON GASES	22.7	98.7	0.	0.	0.	21.0
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.20
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	34.3

TOTAL	29.2	114.	0.	100.	100.	63.5
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HYDROGEN CONSUMPTION-	.5909E-02	LB HYDROGEN/LB COAL
	.1196	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4549 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	29.23	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	39.77	PERCENT

RUN NO. 231

SAMPLE NO. 2

DATE 2 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	4.860	SECONDS
CALCULATED	4.600	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8953	LB/HR	COAL FED	610.0	GRAMS
HYDROGEN FLOW RATE	.9650	LB/HR	CHAR	281.3	GRAMS
HYDROGEN VELOCITY	.1988	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	2500.	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	17.18	38.34

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.830	19.80	18.94
ETHYLENE	0.	0.	0.
ETHANE	.4030	8.724	7.819
BENZENE	.1820	11.83	9.181
TOLUENE	.1600E-02	.1213	.9520E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		40.48	36.03

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	12.0	14.2	0.	0.	0.	9.28
HYDROCARBON GASES	28.5	125.	0.	0.	0.	26.8
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	34.3
TOTAL	40.5	147.	0.	100.	100.	73.2

HYDROGEN CONSUMPTION-	.1973E-01	LB HYDROGEN/LB COAL
	.3993	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4648 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	40.48	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	54.60	PERCENT

RUN NO. 231

SAMPLE NO. 3

DATE 2 -27 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 7.290 SECONDS
CALCULATED 6.900 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.8953	LB/HR	COAL FED	610.0	GRAMS
HYDROGEN FLOW RATE	.9650	LB/HR	CHAR	281.3	GRAMS
HYDROGEN VELOCITY	.1988	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	2500.	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	17.18	38.34

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.273	24.59	23.52
ETHYLENE	0.	0.	0.
ETHANE	.4520	9.785	8.770
BENZENE	.2080	13.52	10.49
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		47.90	42.78

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.5	16.1	0.	0.	0.	10.5
HYDROCARBON GASES	34.4	152.	0.	0.	0.	32.3
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	34.3
TOTAL	47.9	176.	0.	100.	100.	80.0

HYDROGEN CONSUMPTION- .3163E-01 LB HYDROGEN/LB COAL
.6400 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4939 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 47.90 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 65.21 PERCENT

RUN NO. 231

SAMPLE NO. 4

DATE 2 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMIOUS

COAL RESIDENCE TIME-MEASURED	9.720	SECONDS
CALCULATED	9.176	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.8953	LB/HR	COAL FED	610.0	GRAMS
HYDROGEN FLOW RATE	.9650	LB/HR	CHAR	281.3	GRAMS
HYDROGEN VELOCITY	.1988	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	2500.	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	17.18	38.34

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1230	1.334	2.227
CARBON DIOXIDE	0.	0.	0.
METHANE	2.288	24.76	23.68
ETHYLENE	0.	0.	0.
ETHANE	.4300	9.309	8.343
BENZENE	.2030	13.20	10.24
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		48.60	44.49

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.2	15.7	0.	0.	0.	10.2
HYDROCARBON GASES	34.1	151.	0.	0.	0.	32.0
CARBON OXIDES	1.33	0.	6.27	0.	0.	2.23
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	34.3
TOTAL	48.6	174.	6.27	100.	100.	81.7

HYDROGEN CONSUMPTION-	.3108E-01	LB HYDROGEN/LB COAL
	.6289	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4728	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	48.60	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	64.49	PERCENT

RUN NO. 232

SAMPLE NO. 1

DATE 3 -1 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.212	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9310	LB/HR	COAL FED	513.7	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	208.7	GRAMS
HYDROGEN VELOCITY	.1837	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	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	43.52

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	0.	0.	0.
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.2100E-01	1.273	.9941
TOLUENE	.5000E-02	.3537	.2792
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		1.627	1.273

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.63	2.00	0.	0.	0.	1.27
HYDROCARBON GASES	0.	0.	0.	0.	0.	0.
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	27.9
TOTAL	1.63	9.51	0.	100.	100.	32.0

HYDROGEN CONSUMPTION-	-.3782E-01	LB HYDROGEN/LB COAL
	-.7654	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3614 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	1.627	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	1.297	PERCENT

RUN NO. 232

SAMPLE NO. 2

DATE 3, -1 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.424	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	.9310	LB/HR	COAL FED	513.7 GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	208.7 GRAMS
HYDROGEN VELOCITY	.1837	FT/SEC	LIGHT OILS	0. GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0. GRAMS
HYDROGEN PRESSURE	2500.	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	43.52

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.340	13.52	13.01
ETHYLENE	0.	0.	0.
ETHANE	.2700	5.452	4.916
BENZENE	.1050	6.366	4.971
TOLUENE	.1100E-01	.7780	.6142
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		26.12	23.51

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.14	8.64	0.	0.	0.	5.58
HYDROCARBON GASES	19.0	83.9	0.	0.	0.	17.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	27.9
TOTAL	26.1	100.	0.	100.	100.	54.2

HYDROGEN CONSUMPTION-	.8644E-05	LB HYDROGEN/LB COAL
	.1749E-03	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4477 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	26.12	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	34.86	PERCENT

RUN NO. 232 SAMPLE NO. 3 DATE 3 -1 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 6.636 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9310	LB/HR	COAL FED	513.7	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	208.7	GRAMS
HYDROGEN VELOCITY	.1837	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.0100	0.
ASH	17.68	43.52

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.605	16.20	15.59
ETHYLENE	0.	0.	0.
ETHANE	.3000	6.058	5.462
BENZENE	.1400	8.488	6.628
TOLUENE	.7000E-02	.4951	.3909
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		31.24	28.07

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.98	10.8	0.	0.	0.	7.02
HYDROCARBON GASES	22.3	98.8	0.	0.	0.	21.0
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	27.9
TOTAL	31.2	117.	0.	100.	100.	58.8

HYDROGEN CONSUMPTION- .7131E-02 LB HYDROGEN/LB COAL
.1443 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4585 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 31.24 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 42.01 PERCENT

RUN NO. 232

SAMPLE NO. 4

DATE 3 -1 - 1979

COAL TYPE- NEW MEXID SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 8.849 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9310	LB/HR	COAL FED	513.7	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	208.7	GRAMS
HYDROGEN VELOCITY	.1837	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	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	43.52

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.630	16.45	15.83
ETHYLENE	0.	0.	0.
ETHANE	.3500	7.067	6.373
BENZENE	.1580	9.580	7.480
TOLUENE	.5000E-02	.3537	.2792
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		33.45	29.96

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.93	11.9	0.	0.	0.	7.76
HYDROCARBON GASES	23.5	104.	0.	0.	0.	22.2
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	27.9
TOTAL	33.5	123.	0.	100.	100.	60.7

HYDROGEN CONSUMPTION- .9603E-02 LB HYDROGEN/LB COAL
.1943 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4579 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 33.45 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 44.86 PERCENT

STOP

RUN NO. 233

SAMPLE NO. 1

DATE 3 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.460	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9997	LB/HR	COAL FED	597.6	GRAMS
HYDROGEN FLOW RATE	1.050	LB/HR	CHAR	297.4	GRAMS
HYDROGEN VELOCITY	.2575	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.220	0.
SULFUR	.8100	0.
ASH	17.68	35.50

	PRODUCT CONCL. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.4950E-01	.5219	.5021
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1200E-01	.7600	.5934
TOLUENE	.5000E-02	.3694	.2916
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		1.651	1.387

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	HAF COAL
LIQUIDS	1.13	1.41	0.	0.	0.	.885
HYDROCARBON GASES	.522	2.49	0.	0.	0.	.502
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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	1.65	11.4	0.	100.	100.	40.2

HYDROGEN CONSUMPTION-	-.3703E-01	LB HYDROGEN/LB COAL
	-.7494	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3675	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	1.651	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	1.588	PERCENT

RUN NO. 233

SAMPLE NO. 2

DATE 3. -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.910	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.	
COAL FEED RATE	.9997	LB/HR	COAL FED	597.6 GRAMS
HYDROGEN FLOW RATE	1.050	LB/HR	CHAR	297.4 GRAMS
HYDROGEN VELOCITY	.2575	FT/SEC	LIGHT OILS	0. GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0. GRAMS
HYDROGEN PRESSURE	2000.	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	35.53

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.9430	9.942	9.566
ETHYLENE	0.	0.	0.
ETHANE	.1630	3.438	3.100
BENZENE	.7600E-01	4.814	3.758
TOLUENE	.1300E-01	.9605	.7583
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		19.15	17.18

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.77	7.04	0.	0.	0.	4.52
HYDROCARBON GASES	13.4	59.6	0.	0.	0.	12.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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	19.2	74.2	0.	100.	100.	59.0

HYDROGEN CONSUMPTION-	-.1080E-01	LB HYDROGEN/LB COAL
	-.2185	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4240	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	19.15	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	25.00	PERCENT

RUN NO. 233

SAMPLE NO. 3

DATE 3 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.37	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9997	LB/HR	COAL FED	597.6	GRAMS
HYDROGEN FLOW RATE	1.050	LB/HR	CHAR	297.4	GRAMS
HYDROGEN VELOCITY	.2575	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	35.53

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.120	11.81	11.36
ETHYLENE	0.	0.	0.
ETHANE	.2230	4.704	4.242
BENZENE	.1140	7.220	5.638
TOLUENE	.8000E-02	.5911	.4666
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		24.32	21.71

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.81	9.40	0.	0.	0.	6.10
HYDROCARBON GASES	16.5	73.0	0.	0.	0.	15.6
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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	24.3	89.9	0.	100.	100.	63.5

HYDROGEN CONSUMPTION-	-.4205E-02	LB HYDROGEN/LB COAL
	-.8509E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4296	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	24.32	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	32.06	PERCENT

SAMPLE NO.

RUN NO. 233

SAMPLE NO. 4

DATE 3 -6 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
 CALCULATED 9.820 SECONDS

NOMINAL CONDITIONS			- TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9997	LB/HR	COAL FED	597.6	GRAMS
HYDROGEN FLOW RATE	1.050	LB/HR	CHAR	297.4	GRAMS
HYDROGEN VELOCITY	.2575	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	35.53

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.156	12.19	11.73
ETHYLENE	0.	0.	0.
ETHANE	.2380	5.020	4.527
BENZENE	.1310	8.297	6.478
TOLUENE	.6000E-02	.4433	.3500
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		25.95	23.08

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.74	10.5	0.	0.	0.	6.83
HYDROCARBON GASES	17.2	76.0	0.	0.	0.	16.3
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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	25.9	94.0	0.	100.	100.	64.9

HYDROGEN CONSUMPTION- -.2525E-02 LB HYDROGEN/LB COAL
 -.5110E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4281 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 25.95 PERCENT
 EFFECTIVE ENERGY EFFICIENCY- 34.17 PERCENT

DATE 3 -7 - 1979

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.801	SECONDS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.0100	0.
ASH	17.18	32.74

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% HAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.1540	1.523	1.457
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1450E-01	.8615	.6686
TOLUENE	.8000E-02	.5545	.4351
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		2.939	2.560

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.42	1.78	0.	0.	0.	1.10
HYDROCARBON GASES	1.52	7.25	0.	0.	0.	1.46
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	43.9

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HYDROGEN CONSUMPTION- - .3488E+01 LB HYDROGEN/LB COAL  
                      - .7059    ATOM HYDROGEN/ATOM CARBON
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EFFECTIVE CARBON CONVERSION-	2.939	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	3.252	PERCENT

RUN NO. 234

SAMPLE NO. 2

DATE 3 -7 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.602 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9997	LB/HR	COAL FED	764.4	GRAMS
HYDROGEN FLOW RATE	.9850	LB/HR	CHAR	412.8	GRAMS
HYDROGEN VELOCITY	.3221	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	17.18	32.74

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.9480	9.376	8.967
ETHYLENE	0.	0.	0.
ETHANE	.1670	3.305	2.962
BENZENE	.5800E-01	3.446	2.674
TOLUENE	.1500E-01	1.040	.8158
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		17.17	15.42

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.49	5.52	0.	0.	0.	3.49
HYDROCARBON GASES	12.7	56.4	0.	0.	0.	11.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	17.2	69.5	0.	100.	100.	62.1

HYDROGEN CONSUMPTION- -.1276E-01 LB HYDROGEN/LB COAL
-.2582 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4242 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 17.17 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 22.55 PERCENT

RUN NO. 234

SAMPLE NO. 3

DATE 3 -7 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.400	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9997	LB/HR	TOTAL ACCUMULATED MTS.	
HYDROGEN FLOW RATE	.9850	LB/HR	COAL FED	764.4 GRAMS
HYDROGEN VELOCITY	.3221	FT/SEC	CHAR	412.8 GRAMS
REACTOR TEMP.	725.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	1500.	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	17.18	32.74

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAE COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.241	12.27	11.74
ETHYLENE	0.	0.	0.
ETHANE	.2860	5.659	5.072
BENZENE	.8200E-01	4.872	3.781
TOLUENE	.8000E-02	.5545	.4351
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		23.36	21.03

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAE COAL
LIQUIDS	5.43	6.55	0.	0.	0.	4.22
HYDROCARBON GASES	17.9	70.7	0.	0.	0.	16.8
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	23.4	82.7	0.	100.	100.	67.7

HYDROGEN CONSUMPTION-	-.3040E-02	LB HYDROGEN/LB COAL
	-.6153E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4448 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	23.36	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	31.67	PERCENT

RUN NO. 234

SAMPLE NO. 4

DATE 3 -7 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.206	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9997	LB/HR	COAL FED	764.4	GRAMS
HYDROGEN FLOW RATE	.9850	LB/HR	CHAR	412.8	GRAMS
HYDROGEN VELOCITY	.3221	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	17.18	32.74

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.245	12.31	11.78
ETHYLENE	0.	0.	0.
ETHANE	.2830	5.600	5.019
BENZENE	.1050	6.239	4.842
TOLUENE	.9000E-02	.6238	.4895
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	24.78	22.13
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.86	8.27	0.	0.	0.	5.33
HYDROCARBON GASES	17.9	79.6	0.	0.	0.	16.8
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	43.9
TOTAL	24.8	94.4	0.	100.	100.	68.8

HYDROGEN CONSUMPTION-	-.2331E-02	LB HYDROGEN/LB COAL
	-.4717E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4384 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	24.78	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	33.05	PERCENT

RUN NO. 235

SAMPLE NO. 1

DATE 3 -8 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0.96 SECONDS
CALCULATED 1.538 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.010	LB/HR	COAL FED	663.8	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	361.9	GRAMS
HYDROGEN VELOCITY	.4592	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	.9100	0.
ASH	17.18	32.43

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	0.	0.	0.
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1660E-01	.9274	.7198
TOLUENE	.8000E-02	.5214	.4091
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		1.449	1.129

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.45	1.81	0.	0.	0.	1.13
HYDROCARBON GASES	0.	0.	0.	0.	0.	0.
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	44.5
TOTAL	1.45	9.33	0.	100.	100.	48.5

HYDROGEN CONSUMPTION- -.3790E-01 LB HYDROGEN/LB COAL
-.7670 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3611 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 1.449 PERCENT
EFFECTIVE ENERGY EFFICIENCY- .9445 PERCENT

RUN NO. 235

SAMPLE NO. 2

DATE 3 -8 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	1.92	SECONDS
CALCULATED	3.08	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.010	LB/HR	COAL FED	663.8	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	361.9	GRAMS
HYDROGEN VELOCITY	.4592	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	32.43

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAP COAL CONV. TO PRODUCT
CARBON MONOXIDE	.5400E-01	.5033	.8405
CARBON DIOXIDE	0.	0.	0.
METHANE	.7840	7.291	6.973
ETHYLENE	0.	0.	0.
ETHANE	.1410	2.624	2.351
BENZENE	.3550E-01	1.983	1.539
TOLUENE	.2000E-01	1.304	1.023
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		13.71	12.73

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAP COAL
LIQUIDS	3.29	4.13	0.	0.	0.	2.56
HYDROCARBON GASES	9.91	44.1	0.	0.	0.	9.32
CARBON OXIDES	.503	0.	2.37	0.	0.	.840
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	44.5
TOTAL	13.7	55.7	2.37	100.	100.	60.1

HYDROGEN CONSUMPTION-	-.1850E-01	LB HYDROGEN/LB COAL
	-.3744	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4058 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	13.71	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	16.90	PERCENT

RUN NO. 235

SAMPLE NO. 3

DATE 3 -8 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 2.88 SECONDS
CALCULATED 4.62 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.010	LB/HR	COAL FED	663.8	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	361.9	GRAMS
HYDROGEN VELOCITY	.4592	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	32.43

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.6300E-01	.5872	.9806
CARBON DIOXIDE	0.	0.	0.
METHANE	.9270	8.621	8.245
ETHYLENE	0.	0.	0.
ETHANE	.2040	3.796	3.402
BENZENE	.6190E-01	3.458	2.684
TOLUENE	.1900E-01	1.238	.9717
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		17.70	16.28

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.70	5.80	0.	0.	0.	3.66
HYDROCARBON GASES	12.4	54.6	0.	0.	0.	11.6
CARBON OXIDES	.587	0.	2.78	0.	0.	.901
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	44.5
TOTAL	17.7	67.9	2.78	100.	100.	63.6

HYDROGEN CONSUMPTION- -.1341E-01 LB HYDROGEN/LB COAL
-.2713 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4100 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 17.70 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 22.04 PERCENT

RUN NO. 235

SAMPLE NO. 4

DATE 3 -8 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	3.84	SECONDS
CALCULATED	6.153	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.010	LB/HR	COAL FED	663.8	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	361.9	GRAMS
HYDROGEN VELOCITY	.4592	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	32.43

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4800E-01	.4474	.7471
CARBON DIOXIDE	0.	0.	0.
METHANE	.9520	8.854	8.467
ETHYLENE	0.	0.	0.
ETHANE	.2110	3.926	3.519
BENZENE	.6610E-01	3.693	2.866
TOLUENE	.1800E-01	1.173	.9205
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		18.09	16.52

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.87	5.99	0.	0.	0.	3.79
HYDROCARBON GASES	12.8	56.2	0.	0.	0.	12.0
CARBON OXIDES	.447	0.	2.10	0.	0.	.747
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	44.5
TOTAL	18.1	69.7	2.10	100.	100.	63.8

HYDROGEN CONSUMPTION-	-.1267E-01	LB HYDROGEN/LB COAL
	-.2564	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4134 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	18.09	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	22.82	PERCENT

RUN NO. 236

SAMPLE NO. 1

DATE 3 -13 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 4.800 SECONDS
CALCULATED 4.350 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.059	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN FLOW RATE	1.330	LB/HR	CHAR	247.5	GRAMS
HYDROGEN VELOCITY	.2414	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2500.	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	17.18	42.86

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.150	14.50	13.86
ETHYLENE	0.	0.	0.
ETHANE	.1800	4.539	4.068
BENZENE	.1260	9.541	7.404
TOLUENE	.6000E-02	.5300	.4159
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		29.11	25.75

TOTAL MATERIAL BALANCE: %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	10.1	12.1	0.	0.	0.	7.82
HYDROCARBON GASES	19.0	85.2	0.	0.	0.	17.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	28.5
TOTAL	29.1	105.	0.	100.	100.	57.1

HYDROGEN CONSUMPTION- .2017E-02 LB HYDROGEN/LB COAL
.4081E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4308 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 29.11 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 38.39 PERCENT

RUN NO. 236

SAMPLE NO. 2

DATE 3 -13 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	7.200	SECONDS
CALCULATED	6.530	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.060	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN VELOCITY	.2412	FT/SEC	CHAR	247.5	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	2500.	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	17.18	42.86

PRODUCT CONC. IN
GAS, MOLE %

% CARBON CONV.
TO PRODUCT

% MAF COAL CONV.
TO PRODUCT

CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.640	16.48	15.76
ETHYLENE	0.	0.	0.
ETHANE	.4130	8.301	7.440
BENZENE	.2230	13.46	10.44
TOLUENE	.4000E-02	.2816	.2210
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL

38.51

33.86

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.7	16.4	0.	0.	0.	10.7
HYDROCARBON GASES	24.8	108.	0.	0.	0.	23.2
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	28.5

TOTAL	38.5	132.	0.	100.	100.	65.2
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HYDROGEN CONSUMPTION-	.1338E-01	LB HYDROGEN/LB COAL
	.2707	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4367 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	38.51	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	50.50	PERCENT

RUN NO. 236

SAMPLE NO. 3

DATE 3 -13 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	9.600	SECONDS
CALCULATED	8.694	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.059	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.210	LB/HR	COAL FED	600.0	GRAMS
HYDROGEN VELOCITY	.2414	FT/SEC	CHAR	247.5	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	2500.	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	17.18	42.86

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.490	17.09	16.34
ETHYLENE	0.	0.	0.
ETHANE	.3170	7.273	6.518
BENZENE	.1750	12.06	9.356
TOLUENE	.2000E-02	.1607	.1261
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		36.58	32.34

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	12.2	14.6	0.	0.	0.	9.48
HYDROCARBON GASES	24.4	107.	0.	0.	0.	22.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	28.5
TOTAL	36.6	129.	0.	100.	100.	63.6

HYDROGEN CONSUMPTION-	.1230E-01	LB HYDROGEN/LB COAL
	.2488	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4450	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	36.58	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.65	PERCENT

RUN NO. 237

SAMPLE NO. 1

DATE 3 -14 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.020	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.129	LB/HR	COAL FED	659.7	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	302.0	GRAMS
HYDROGEN VELOCITY	.2715	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	38.62

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.1300	1.248	1.201
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.3000E-01	1.730	1.351
TOLUENE	.5000E-02	.3364	.2656
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	3.315	2.817
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.07	2.52	0.	0.	0.	1.62
HYDROCARBON GASES	1.25	5.94	0.	0.	0.	1.20
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	34.1
TOTAL	3.31	16.0	0.	100.	100.	39.8

HYDROGEN CONSUMPTION-	-.3512E-01	LB HYDROGEN/LB COAL
	-.7107	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3633	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	3.315	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	3.708	PERCENT

RUN NO. 237

SAMPLE NO. 2

DATE 3 -14 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.030 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.129	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.080	LB/HR	COAL FED	659.7	GRAMS
HYDROGEN VELOCITY	.2715	FT/SEC	CHAR	302.0	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	38.62

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.415	13.58	13.07
ETHYLENE	0.	0.	0.
ETHANE	.2660	5.109	4.607
BENZENE	.1500	8.651	6.754
TOLUENE	.8000E-02	.5382	.4249
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		27.88	24.86

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	9.19	11.0	0.	0.	0.	7.18
HYDROCARBON GASES	18.7	82.9	0.	0.	0.	17.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	34.1
TOTAL	27.9	101.	0.	100.	100.	61.8

HYDROGEN CONSUMPTION- .6157E-03 LB HYDROGEN/LB COAL
.1246E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4319 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 27.88 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 36.83 PERCENT

RUN NO. 237

SAMPLE NO. 3

DATE 3 -14 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.050	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.129	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	1.080	LB/HR	COAL FED	659.7	GRAMS
HYDROGEN VELOCITY	.2715	FT/SEC	CHAR	302.0	GRAMS
REACTOR TEMP.	750.0	DEG C	LIGHT OILS	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	BTX	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	38.62

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.634	15.69	15.09
ETHYLENE	0.	0.	0.
ETHANE	.3040	5.839	5.265
BENZENE	.2030	11.71	9.141
TOLUENE	.4000E-02	.2691	.2124
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		33.50	29.71

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	12.0	14.3	0.	0.	0.	9.35
HYDROCARBON GASES	21.5	95.5	0.	0.	0.	20.4
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	34.1
TOTAL	33.5	117.	0.	100.	100.	66.7

HYDROGEN CONSUMPTION-	.7257E-02	LB HYDROGEN/LB COAL
	.1469	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4345 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	33.50	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	44.19	PERCENT

RUN NO. 237

SAMPLE NO. 4

DATE 3 -14 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 8.063 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.129	LB/HR	COAL FED	659.7	GRAMS
HYDROGEN FLOW RATE	1.080	LB/HR	CHAR	302.0	GRAMS
HYDROGEN VELOCITY	.2715	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.000	0.
SULFUR	.0100	0.
ASH	17.18	38.62

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.645	15.79	15.10
ETHYLENE	0.	0.	0.
ETHANE	.2400	4.610	4.131
BENZENE	.1990	11.48	8.907
TOLUENE	.2000E-02	.1346	.1056
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL 32.01 28.25

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	11.6	13.8	0.	0.	0.	9.01
HYDROCARBON GASES	20.4	91.7	0.	0.	0.	19.2
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	33.9
TOTAL	32.0	113.	0.	100.	100.	65.0

HYDROGEN CONSUMPTION- .5441E-02 LB HYDROGEN/LB COAL
.1101 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4312 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 32.01 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 42.48 PERCENT

RUN NO. 238

SAMPLE NO. 1

DATE 3 -15 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.740	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.070	LB/HR	COAL FED	606.0	GRAMS
HYDROGEN FLOW RATE	1.030	LB/HR	CHAR	306.9	GRAMS
HYDROGEN VELOCITY	.3453	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	34.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.2330	2.252	2.167
ETHYLENE	0.	0.	0.
ETHANE	.3100E-01	.5994	.5405
BENZENE	.4000E-02	.2322	.1813
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		3.084	2.889

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.232	.276	0.	0.	0.	.181
HYDROCARBON GASES	2.85	12.9	0.	0.	0.	2.71
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	40.0
TOTAL	3.08	20.7	0.	100.	100.	45.8

HYDROGEN CONSUMPTION-	-.3317E-01	LB HYDROGEN/LB COAL
	-.6711	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3795	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	3.084	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	4.550	PERCENT

RUN NO. 238

SAMPLE NO. 2

DATE 3 -15 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	3.480	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.070	LB/HR	COAL FED	606.0	GRAMS
HYDROGEN FLOW RATE	1.030	LB/HR	CHAR	306.9	GRAMS
HYDROGEN VELOCITY	.3453	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	34.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.193	11.53	11.09
ETHYLENE	0.	0.	0.
ETHANE	.3320	6.420	5.789
BENZENE	.9900E-01	5.748	4.488
TOLUENE	.1200E-01	.8128	.6416
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		24.51	22.01

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.56	7.95	0.	0.	0.	5.13
HYDROCARBON GASES	18.0	77.8	0.	0.	0.	16.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	40.0
TOTAL	24.5	93.3	0.	100.	100.	64.9

HYDROGEN CONSUMPTION-	-.2804E-02	LB HYDROGEN/LB COAL
	-.5674E-01	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4346	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	24.51	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	32.42	PERCENT

RUN NO. 238

SAMPLE NO. 3

DATE 3 -15 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 5.220 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.070	LB/HR	COAL FED	606.0	GRAMS
HYDROGEN FLOW RATE	1.030	LB/HR	CHAR	306.9	GRAMS
HYDROGEN VELOCITY	.3453	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	34.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1060	1.027	1.725
CARBON DIOXIDE	0.	0.	0.
METHANE	1.373	13.27	12.77
ETHYLENE	0.	0.	0.
ETHANE	.3100	5.994	5.405
BENZENE	.1360	7.896	6.165
TOLUENE	.5000E-02	.3387	.2673
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL 28.53 26.33

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	8.23	9.86	0.	0.	0.	6.43
HYDROCARBON GASES	19.3	84.6	0.	0.	0.	18.2
CARBON OXIDES	1.03	0.	4.83	0.	0.	1.72
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.	40.0

TOTAL 28.5 102. 4.83 100. 100. 69.2

HYDROGEN CONSUMPTION- .8230E-03 LB HYDROGEN/LB COAL
.1665E-01 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4185 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 28.53 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 36.75 PERCENT

RUN NO. 238

SAMPLE NO. 4

DATE 3 -15 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 6.965 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.070	LB/HR	COAL FED	606.0	GRAMS
HYDROGEN FLOW RATE	1.030	LB/HR	CHAR	306.9	GRAMS
HYDROGEN VELOCITY	.3453	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	750.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	1500.	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	34.91

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.9600E-01	.9299	1.562
CARBON DIOXIDE	0.	0.	0.
METHANE	1.361	13.15	12.66
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.3040	17.65	13.78
TOLUENE	.1320	8.941	7.058
XYLENE	.5000E-02	.3870	.3080
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		41.06	35.37

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	27.0	33.7	0.	0.	0.	21.1
HYDROCARBON GASES	13.2	62.6	0.	0.	0.	12.7
CARBON OXIDES	.930	0.	4.37	0.	0.	1.56
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.	40.0
TOTAL	41.1	104.	4.37	100.	100.	78.3

HYDROGEN CONSUMPTION- .1629E-02 LB HYDROGEN/LB COAL
.3297E-01 ATOM HYDROGEN/ATUM CARBON

HEAT OF REACTION- -.3503 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 41.06 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 38.48 PERCENT

RUN NO. 239

SAMPLE NO. 1

DATE 3 -20 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	1.480	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.006	LB/HR	COAL FED	646.5	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	374.2	GRAMS
HYDROGEN VELOCITY	.5102	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	30.55

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	0.	0.	0.
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1200E-01	.7479	.5804
TOLUENE	.7000E-02	.5089	.3993
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		1.257	.9797

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.26	1.58	0.	0.	0.	.980
HYDROCARBON GASES	0.	0.	0.	0.	0.	0.
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	48.5
TOTAL	1.26	9.10	0.	100.	100.	52.4

HYDROGEN CONSUMPTION-	-.3800E-01	LB HYDROGEN/LB COAL
	-.7689	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3619	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	1.257	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	.7616	PERCENT

RUN NO. 239

SAMPLE NO. 2

DATE 3 -20 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 2.960 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.006	LB/HR	COAL FED	646.5	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	374.2	GRAMS
HYDROGEN VELOCITY	.5102	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	4.100	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.18	30.55

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.4040	4.191	4.008
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.2840E-01	1.770	1.374
TOLUENE	.1300E-01	.9451	.7416
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		6.906	6.123

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.72	3.39	0.	0.	0.	2.12
HYDROCARBON GASES	4.19	20.0	0.	0.	0.	4.01
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	48.5
TOTAL	6.91	30.9	0.	100.	100.	57.5

HYDROGEN CONSUMPTION- -.2890E-01 LB HYDROGEN/LB COAL
-.5848 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3865 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 6.906 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 8.337 PERCENT

RUN NO. 239

SAMPLE NO. 3

DATE 3 -20 - 1979

COAL TYPE- NEW MEXIO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.440 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.006	LB/HR	COAL FED	646.5	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	374.2	GRAMS
HYDROGEN VELOCITY	.5102	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	30.55

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.5790	6.007	5.744
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.4300E-01	2.680	2.080
TOLUENE	.1200E-01	.8724	.6846
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		9.559	8.509

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.55	4.38	0.	0.	0.	2.76
HYDROCARBON GASES	6.01	28.6	0.	0.	0.	5.74
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	48.5
TOTAL	9.56	40.5	0.	100.	100.	59.9

HYDROGEN CONSUMPTION- -.2487E-01 LB HYDROGEN/LB COAL
-.5033 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3951 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 9.559 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 12.09 PERCENT

RUN NO. 239

SAMPLE NO. 4

DATE 3 -20 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.920	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.006	LB/HR	COAL FED	646.5	GRAMS
HYDROGEN FLOW RATE	1.040	LB/HR	CHAR	374.2	GRAMS
HYDROGEN VELOCITY	.5102	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	725.0	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	17.18	30.55

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.6140	6.370	6.092
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.4900E-01	3.054	2.370
TOLUENE	.1200E-01	.8724	.6846
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		10.30	9.146

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.93	4.82	0.	0.	0.	3.05
HYDROCARBON GASES	6.37	30.0	0.	0.	0.	6.09
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.80
HYDROGEN SULFIDE	0.	1.01	0.	0.	100.	1.04
CHAR	0.	0.	0.	0.	0.	48.5
TOTAL	10.3	42.7	0.	100.	100.	60.5

HYDROGEN CONSUMPTION-	-.2396E-01	LB HYDROGEN/LB COAL
	-.4849	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.3959	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	10.30	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	13.04	PERCENT

RUN NO. 240

SAMPLE NO. 1

DATE 3 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.510	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.649	LB/HR	COAL FED	1026.	GRAMS
HYDROGEN FLOW RATE	.5070	LB/HR	CHAR	427.0	GRAMS
HYDROGEN VELOCITY	.1227	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	2500.	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,	42.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4130	1.278	2.146
CARBON DIOXIDE	0.	0.	0.
METHANE	20.06	61.91	59.57
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.8100E-01	1.502	1.173
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		64.69	62.89

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.50	1.79	0.	0.	0.	1.17
HYDROCARBON GASES	61.9	295.	0.	0.	0.	59.6
CARBON OXIDES	1.28	0.	6.01	0.	0.	2.15
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.	29.1
TOTAL	64.7	304.	6.01	100.	100.	94.8

HYDROGEN CONSUMPTION-	.8532E-01	LB HYDROGEN/LB COAL
	1.727	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.7499	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	58.87	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	89.23	PERCENT

RUN NO. 240

SAMPLE NO. 2

DATE 3 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	5.020	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.649	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.5550	LB/HR	COAL FED	1026. GRAMS
HYDROGEN VELOCITY	.1227	FT/SEC	CHAR	427.0 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	2500.	PSI	WATER	0. GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.100	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	42.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAP COAL CONV. TO PRODUCT
CARBON MONOXIDE	.2140	.7247	1.217
CARBON DIOXIDE	0.	0.	0.
METHANE	18.30	61.83	59.49
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1100E-01	.2233	.1743
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		62.78	60.88

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAP COAL
LIQUIDS	.223	.266	0.	0.	0.	.174
HYDROCARBON GASES	61.8	294.	0.	0.	0.	59.5
CARBON OXIDES	.725	0.	3.41	0.	0.	1.22
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
CHOR	0.	0.	0	0.	0.	29.1
TOTAL	62.8	302.	3.41	100.	100.	92.9

HYDROGEN CONSUMPTION-	.8452E-01	LB HYDROGEN/LB COAL
	1.710	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.7646 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	58.52	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	90.06	PERCENT

RUN NO. 240

SAMPLE NO. 3

DATE 3 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	7.530	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.649	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.5550	LB/HR	COAL FED	1026. GRAMS
HYDROGEN VELOCITY	.1227	FT/SEC	CHAR	427.0 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	2500.	PSI	WATER	0. GRAMS

	COAL ANALYSIS, %	CHAR ANALYSIS, %	0
CARBON	59.30	0.	
HYDROGEN	4.180	0.	
OXYGEN	16.80	0.	
NITROGEN	1.230	0.	
SULFUR	.8100	0.	
ASH	17.68	42.48	

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.7600	2.574	4.323
CARBON DIOXIDE	0.	0.	0.
METHANE	19.32	65.27	62.80
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.3000E-02	.6089E-01	.4754E-01
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		67.91	67.17

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.609E-01	.725E-01	0.	0.	0.	.475E-01
HYDROCARBON GASES	65.3	311.	0.	0.	0.	62.8
CARBON OXIDES	2.57	0.	12.1	0.	0.	4.32
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.	29.1
TOTAL	67.9	318.	12.1	100.	100.	99.1

HYDROGEN CONSUMPTION-	.9129E-01	LB HYDROGEN/LB COAL
	1.847	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.7597 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	59.44	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	89.12	PERCENT

RUN NO. 240

SAMPLE NO. 4

DATE 3 -21 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0.
CALCULATED 10.04 SECONDS
SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.649	LB/HR	COAL FED	1026.	GRAMS
HYDROGEN FLOW RATE	.5070	LB/HR	CHAR	427.0	GRAMS
HYDROGEN VELOCITY	.1227	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	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.100	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	42.48

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.9460	2.926	4.916
CARBON DIOXIDE	0.	0.	0.
METHANE	23.30	71.91	69.19
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	0.	0.	0.
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		74.84	74.11

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	0.	0.	0.	0.	0.	0.
HYDROCARBON GASES	71.9	342.	0.	0.	0.	69.2
CARBON OXIDES	2.93	0.	13.8	0.	0.	4.92
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.	29.1
TOTAL	74.8	350.	13.8	100.	100.	106.

HYDROGEN CONSUMPTION: .1045 LB HYDROGEN/LB COAL
2.114 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8018 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 60.51 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 90.65 PERCENT

RUN NO. 241

SAMPLE NO. 1

DATE 3 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.290	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.039	LB/HR	COAL FED	657.4	GRAMS
HYDROGEN FLOW RATE	.9300	LB/HR	CHAR	254.0	GRAMS
HYDROGEN VELOCITY	.2159	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	2500.	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	45.76

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	7.024	63.09	60.70
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.6200E-01	3.345	2.612
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	66.43	63.31
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	3.35	3.98	0.	0.	0.	2.61
HYDROCARBON GASES	63.1	300.	0.	0.	0.	60.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	25.5

TOTAL	66.4	312.	0.	100.	100.	91.6
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HYDROGEN CONSUMPTION-	.8858E-01	LB HYDROGEN/LB COAL
	1.792	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.7704 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	59.18	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	90.66	PERCENT

RUN NO. 241

SAMPLE NO. 2

DATE 3 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.585	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.039	LB/HR	COAL FED	657.4	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	254.0	GRAMS
HYDROGEN VELOCITY	.2159	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	2500.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.90	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	45.76

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	8.010	72.41	69.67
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.8000E-02	.4344	.3392
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		72.84	70.01

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.434	.517	0.	0.	0.	.339
HYDROCARBON GASES	72.4	345.	0.	0.	0.	69.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	25.5
TOTAL	72.8	350.	0.	100.	100.	98.2

HYDROGEN CONSUMPTION-	.1057	LB HYDROGEN/LB COAL
	2.139	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8515 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	60.22	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	93.69	PERCENT

RUN NO. 241

SAMPLE NO. 3

DATE 3 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.880	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.039	LB/HR	COAL FED	657.4	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	254.0	GRAMS
HYDROGEN VELOCITY	.2159	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	2500.	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	45.76

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	8.690	78.56	75.58
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.3300E-02	.1792	.1399
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		78.74	75.72

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.179	.213	0.	0.	0.	.140
HYDROCARBON GASES	78.6	374.	0.	0.	0.	75.6
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	25.5
TOTAL	78.7	382.	0.	100.	100.	104.

HYDROGEN CONSUMPTION-	.1178	LB HYDROGEN/LB COAL
	2.384	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8968 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	61.04	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	95.09	PERCENT

RUN NO. 241

SAMPLE NO. 4

DATE 3 -22 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 8.990 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.039	LB/HR	COAL FED	657.4	GRAMS
HYDROGEN FLOW RATE	.9360	LB/HR	CHAR	254.0	GRAMS
HYDROGEN VELOCITY	.2159	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	2500.	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	45.76

	PRODUCT COAL, IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	8.780	79.37	76.37
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	0.	0.	0.
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		79.37	76.37

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	0.	0.	0.	0.	0.	0.
HYDROCARBON GASES	79.4	378.	0.	0.	0.	76.4
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	25.5
TOTAL	79.4	385.	0.	100.	100.	105.

HYDROGEN CONSUMPTION- .1193 LB HYDROGEN/LB COAL
2.415 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.9035 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 61.13 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 95.30 PERCENT

RUN NO. 242

SAMPLE NO. 1

DATE 3 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	2.080	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9085	LB/HR	COAL FED	577.5	GRAMS
HYDROGEN FLOW RATE	.8530	LB/HR	CHAR	239.8	GRAMS
HYDROGEN VELOCITY	.2580	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	2000.	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	42.58

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	4.850	45.71	43.98
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1250	7.078	5.526
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	52.79	49.51
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.08	8.42	0.	0.	0.	5.53
HYDROCARBON GASES	45.7	218.	0.	0.	0.	44.0
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	29.0

TOTAL	52.8	234.	0.	100.	100.	81.3
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HYDROGEN CONSUMPTION-	.5585E-01	LB HYDROGEN/LB COAL
	1.130	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6276 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	52.79	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	78.47	PERCENT

RUN NO. 242

SAMPLE NO. 2

DATE 3 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.150 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	.9085	LB/HR	COAL FED	577.5	GRAMS
HYDROGEN FLOW RATE	.9410	LB/HR	CHAR	239.8	GRAMS
HYDROGEN VELOCITY	.2580	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	2000.	PSI			

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.100	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	42.58

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	6.966	72.43	69.69
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.2000E-01	1.249	.9754
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL 73.68 70.66

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	1.25	1.49	0.	0.	0.	.975
HYDROCARBON GASES	72.4	345.	0.	0.	0.	69.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	29.0

TOTAL 73.7 354. 0. 100. 100. 102.

HYDROGEN CONSUMPTION- .1061 LB HYDROGEN/LB COAL
2.148 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8477 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 60.34 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 93.52 PERCENT

RUN NO. 242

SAMPLE NO. 3

DATE 3 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.230	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9085	LB/HR	TOTAL ACCUMULATED WTS.	
HYDROGEN FLOW RATE	.9320	LB/HR	COAL FED	577.5 GRAMS
HYDROGEN VELOCITY	.2580	FT/SEC	CHAR	239.8 GRAMS
REACTOR TEMP.	900.0	DEG C	LIGHT OILS	0. GRAMS
PREHEAT TEMP.	900.0	DEG C	BTX	0. GRAMS
HYDROGEN PRESSURE	2000.	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	42.58

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	6.525	67.20	64.65
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1150E-01	.7115	.5555
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	67.91	65.21
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.711	.847	0.	0.	0.	.555
HYDROCARBON GASES	67.2	320.	0.	0.	0.	64.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	29.0

TOTAL	67.9	328.	0.	100.	100.	97.0
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HYDROGEN CONSUMPTION-	.9544E-01	LB HYDROGEN/LB COAL
	1.931	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.8127 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	59.44	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	92.32	PERCENT

RUN NO. 242

SAMPLE NO. 4

DATE 3 -27 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	8.295	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	.9085	LB/HR	COAL FED	577.5	GRAMS
HYDROGEN FLOW RATE	.8530	LB/HR	CHAR	239.8	GRAMS
HYDROGEN VELOCITY	.2580	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	2000.	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	12.58

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.4400E-01	.4157	.6983
CARBON DIOXIDE	0.	0.	0.
METHANE	7.440	70.13	67.47
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.8000E-02	.4530	.3537
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		70.99	68.52

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	.453	.539	0.	0.	0.	.354
HYDROCARBON GASES	70.1	334.	0.	0.	0.	67.5
CARBON OXIDES	.416	0.	1.95	0.	0.	.698
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.	29.0
TOTAL	71.0	342.	1.95	100.	100.	100.

HYDROGEN CONSUMPTION-	.1011	LB HYDROGEN/LB COAL
	2.047	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.8281	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	59.93	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	92.68	PERCENT

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 1.593 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.020	LB/HR	COAL FED	532.6	GRAMS
HYDROGEN FLOW RATE	.9300	LB/HR	CHAR	181.2	GRAMS
HYDROGEN VELOCITY	.5651	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	16.20	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	51.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.330	22.48	21.63
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1370	7.941	6.200
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	30.42	27.83
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	7.94	9.45	0.	0.	0.	6.20
HYDROCARBON GASES	22.5	107.	0.	0.	0.	21.6
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	19.9

TOTAL	30.4	124.	0.	100.	100.	50.5
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HYDROGEN CONSUMPTION-	.1004E-01	LB HYDROGEN/LB COAL
	.2032	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4568 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	30.42	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	43.14	PERCENT

COAL NO. 243

SAMPLE NO. 2

DATE 3 -29 --1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 3.186 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.020	LB/HR	COAL FED	532.6	GRAMS
HYDROGEN FLOW RATE	.9800	LB/HR	CHAR	181.2	GRAMS
HYDROGEN VELOCITY	.5651	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	51.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	4.820	46.51	44.75
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.1200	6.956	5.431
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		53.46	50.18

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	6.96	8.28	0.	0.	0.	5.43
HYDROCARBON GASES	46.5	221.	0.	0.	0.	44.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	19.9
TOTAL	53.5	237.	0.	100.	100.	72.9

HYDROGEN CONSUMPTION- .5737E-01 LB HYDROGEN/LB COAL
1.161 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6339 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 53.46 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 79.59 PERCENT

RUN NO. 243

SAMPLE NO. 3

DATE 3 -29 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	4.800	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.020	LB/HR	TOTAL ACCUMULATED WTS.		
HYDROGEN FLOW RATE	.9800	LB/HR	COAL FED	532.6	GRAMS
HYDROGEN VELOCITY	.5651	FT/SEC	CHAR	181.2	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	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.8100	0.
ASH	17.68	51.97

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	5.013	48.37	46.54
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.9300E-01	5.391	4.209
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		53.76	50.75

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	5.39	6.42	0.	0.	0.	4.21
HYDROCARBON GASES	48.4	230.	0.	0.	0.	46.5
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	19.9
TOTAL	53.8	244.	0.	100.	100.	73.5

HYDROGEN CONSUMPTION-	.6030E-01	LB HYDROGEN/LB COAL
	1.220	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.6549	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	53.76	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	80.90	PERCENT

RUN NO. 243

SAMPLE NO. 4

DATE 3 -29 - 1979

COAL TYPE- NEW MEXICO SUB BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
 CALCULATED 6.373 SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.020	LB/HR	COAL FED	532.6	GRAMS
HYDROGEN FLOW RATE	.9800	LB/HR	CHAR	181.2	GRAMS
HYDROGEN VELOCITY	.5651	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	51.07

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	.1440	1.393	2.339
CARBON DIOXIDE	0.	0.	0.
METHANE	5.243	50.59	48.67
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.7900E-01	4.579	3.575
TOLUENE	0.	0.	0.
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.

TOTAL	56.56	54.59
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TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	4.58	5.45	0.	0.	0.	3.58
HYDROCARBON GASES	50.6	241.	0.	0.	0.	48.7
CARBON OXIDES	1.39	0.	6.55	0.	0.	2.34
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.01	0.	0.	100.	1.05
CHAR	0.	0.	0.	0.	0.	19.9

TOTAL	56.6	254.	6.55	100.	100.	77.3
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HYDROGEN CONSUMPTION- .6431E-01 1.301
 1.301 1.8 HYDROGEN/LB COAL
 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.6518 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	56.56	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	83.53	PERCENT

RUN NO. 244

SAMPLE NO. 1

DATE 4 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 2.102 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.030	LB/HR	COAL FED	577.7	GRAMS
HYDROGEN FLOW RATE	.9270	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.2426	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	775.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	41.02

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	.5420	4.896	4.711
ETHYLENE	0.	0.	0.
ETHANE	0.	0.	0.
BENZENE	.3940E-01	2.138	1.669
TOLUENE	.1340E-01	.8483	.6697
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		7.882	7.050

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	2.99	3.70	0.	0.	0.	2.34
HYDROCARBON GASES	4.90	29.0	0.	0.	0.	4.71
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	30.9
TOTAL	7.88	34.5	0.	100.	100.	40.8

HYDROGEN CONSUMPTION- -.2737E-01 LB HYDROGEN/LB COAL
-.5538 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.3823 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 7.882 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 9.810 PERCENT

RUN NO. 244

SAMPLE NO. 2

DATE 4 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED 0. SECONDS
CALCULATED 4.204 SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.030	LB/HR	COAL FED	577.7	GRAMS
HYDROGEN FLOW RATE	.9270	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.2426	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	775.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

TOTAL ACCUMULATED MTS.

	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	41.02

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.840	16.62	15.99
ETHYLENE	0.	0.	0.
ETHANE	.2870	5.187	4.677
BENZENE	.2150	11.67	9.110
TOLUENE	.4000E-02	.2532	.1999
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		33.73	29.98

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	11.9	14.2	0.	0.	0.	9.31
HYDROCARBON GASES	21.8	97.7	0.	0.	0.	20.7
CARBON DIOXIDE	0.	0.	0.	0.	0.	0.
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.	30.9
TOTAL	33.7	119.	0.	100.	100.	63.7

HYDROGEN CONSUMPTION- .8116E-02 LB HYDROGEN/LB COAL
.1642 ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4349 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION- 33.73 PERCENT
EFFECTIVE ENERGY EFFICIENCY- 44.74 PERCENT

RUN NO. 244

SAMPLE NO. 3

DATE 4 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.306	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.030	LB/HR	COAL FED	577.7	GRAMS
HYDROGEN FLOW RATE	.9870	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.2426	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	775.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	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	41.02

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.018	18.23	17.54
ETHYLENE	0.	0.	0.
ETHANE	.2660	4.807	4.335
BENZENE	.2640	14.33	11.19
TOLUENE	.2000E-02	.1266	.9995E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		37.49	33.16

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	14.5	17.2	0.	0.	0.	11.3
HYDROCARBON GASES	23.0	104.	0.	0.	0.	21.9
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	30.9
TOTAL	37.5	129.	0.	100.	100.	66.9

HYDROGEN CONSUMPTION-	.1200E-01	LB HYDROGEN/LB COAL
	.2429	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION- -.4327 KCAL/GRAM OF COAL FED

EFFECTIVE CARBON CONVERSION-	37.49	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	49.44	PERCENT

RUN NO. 244

SAMPLE NO. 4

DATE 4 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	8.408	SECONDS

NOMINAL CONDITIONS

COAL FEED RATE	1.030	LB/HR	COAL FED	577.7	GRAMS
HYDROGEN FLOW RATE	.9270	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.2426	FT/SEC	LIGHT OILS	0.	GRAMS
REACTOR TEMP.	775.0	DEG C	BTX	0.	GRAMS
PREHEAT TEMP.	30.00	DEG C	WATER	0.	GRAMS
HYDROGEN PRESSURE	2000.	PSI			

TOTAL ACCUMULATED MTS.

	COAL ANALYSIS, %	CHAR ANALYSIS, %
CARBON	59.30	0.
HYDROGEN	4.180	0.
OXYGEN	16.80	0.
NITROGEN	1.230	0.
SULFUR	.0100	0.
ASH	17.68	41.02

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	2.280	20.60	19.82
ETHYLENE	0.	0.	0.
ETHANE	.2970	5.368	4.840
BENZENE	.2490	13.51	10.55
TOLUENE	.1300E-02	.8230E-01	.6497E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		39.56	35.27

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	13.6	16.2	0.	0.	0.	10.6
HYDROCARBON GASES	26.0	117.	0.	0.	0.	24.7
CARBON OXIDES	0.	0.	0.	0.	0.	0.
WATER	0.	0.	0.	0.	0.	0.
AMMONIA	0.	6.31	0.	100.	0.	1.81
HYDROGEN SULFIDE	0.	1.21	0.	0.	100.	1.06
CHAR	0.	0.	0.	0.	0.	20.9

TOTAL	39.6	141.	0.	100.	100.	69.0
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HYDROGEN CONSUMPTION-	.1712E-01	LB HYDROGEN/LB COAL
	.3464	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4550	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	39.56	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	53.05	PERCENT

RUN NO. 244

SAMPLE NO. 5

DATE 4 -3 - 1979

COAL TYPE- NEW MEXICO SUB-BITUMINOUS

COAL RESIDENCE TIME-MEASURED	0.	SECONDS
CALCULATED	6.306	SECONDS

NOMINAL CONDITIONS			TOTAL ACCUMULATED WTS.		
COAL FEED RATE	1.030	LB/HR	COAL FED	577.7	GRAMS
HYDROGEN FLOW RATE	1.000	LB/HR	CHAR	249.0	GRAMS
HYDROGEN VELOCITY	.2426	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	2000.	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	41.02

	PRODUCT CONC. IN GAS, MOLE %	% CARBON CONV. TO PRODUCT	% MAF COAL CONV. TO PRODUCT
CARBON MONOXIDE	0.	0.	0.
CARBON DIOXIDE	0.	0.	0.
METHANE	1.816	17.70	17.03
ETHYLENE	0.	0.	0.
ETHANE	.2430	4.738	4.272
BENZENE	.2430	14.23	11.11
TOLUENE	.1500E-02	.1024	.8087E-01
XYLENE	0.	0.	0.
LIGHT OIL	0.	0.	0.
WATER	0.	0.	0.
TOTAL		36.76	32.49

TOTAL MATERIAL BALANCE, %

	CARBON	HYDROGEN	OXYGEN	NITROGEN	SULFUR	MAF COAL
LIQUIDS	14.3	17.1	0.	0.	0.	11.2
HYDROCARBON GASES	22.4	101.	0.	0.	0.	21.3
CARBON OXIDES	0.	0.	0.	0.	0.	0.
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.	30.9
TOTAL	36.8	126.	0.	100.	100.	66.2

HYDROGEN CONSUMPTION-	.1077E-01	LB HYDROGEN/LB COAL
	.2180	ATOM HYDROGEN/ATOM CARBON

HEAT OF REACTION-	-.4292	KCAL/GRAM OF COAL FED
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EFFECTIVE CARBON CONVERSION-	36.76	PERCENT
EFFECTIVE ENERGY EFFICIENCY-	48.42	PERCENT

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