

II. C. IN VITRO CONVERSION: PROCESSES INVOLVING SYNTHESIS GAS

1. CONVERSION TO SYNTHESIS GAS

This profile includes processes for conversion of a starting material, including solid carbonaceous material, to synthesis gas, i.e., $\text{CO}+\text{H}_2$, which may be used as a fuel or as a reactant to make synthetic liquid hydrocarbons (e.g., gasoline) or gaseous hydrocarbons (e.g., fuel gas). Peripheral areas wherein $\text{CO}+\text{H}_2$ may be produced as an intermediate or by-product have not been included.

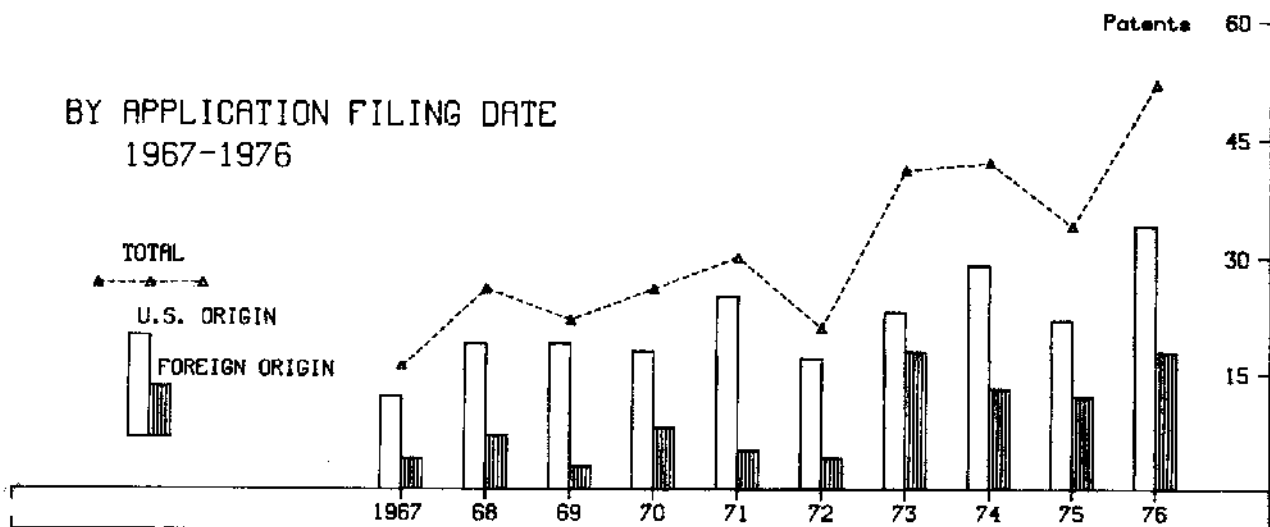
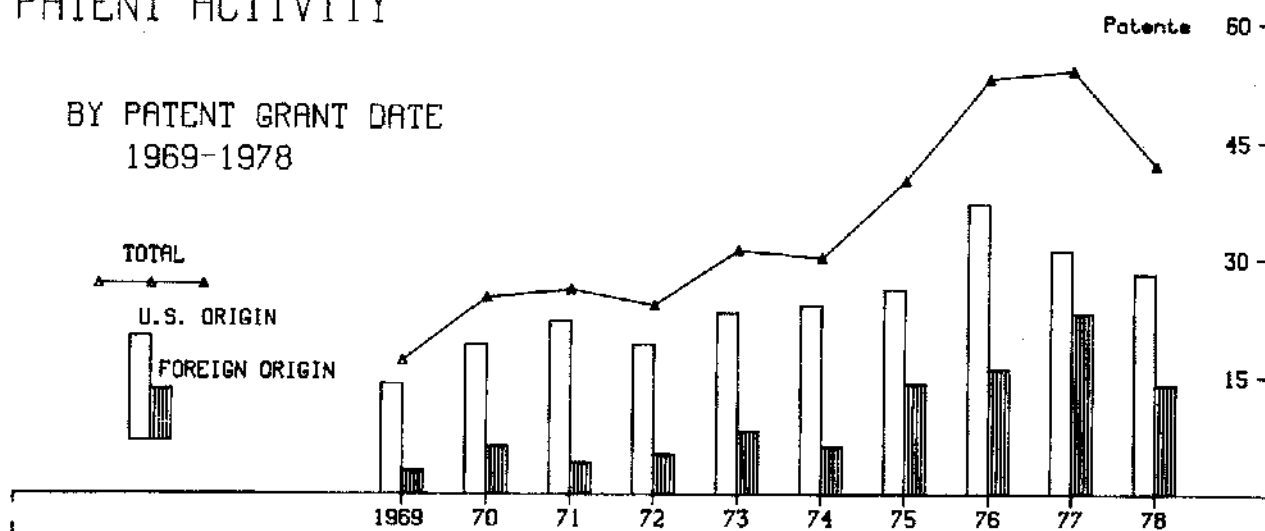
INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

Class 252, Subclass 373

ACTIVITY INDICES (1976-1978)

GROWTH	43.6%
FOREIGN SHARE	35.6%
CORPORATE OWNED	90.6%
GOVERNMENT OWNED	4.7%
U.S. OWNED OF FOREIGN	11.3%

PATENT ACTIVITY



SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	18	11	9	7	9	17	25	26	24	31	30	40	53	54	42	396
U.S. ORIGIN	14	9	7	6	7	14	19	22	19	23	24	26	37	31	28	286
FOREIGN ORIGIN	4	2	2	1	2	3	6	4	5	8	6	14	16	23	14	110
GERMANY	1	1		1		2	4	1	1	3	1	8	7	11	7	48
JAPAN							1	1	1	1	1	2	4	7	4	21
UNITED KINGDOM	1	1	1		1		1	2	1	1	1		2	2	1	12
NETHERLANDS					1				1			2	3	2	1	10
FRANCE	1		1			1			1	1					1	6
CANADA											2	1			1	3
SWEDEN	1															2
ITALY											1					2
MEXICO										2						2
U.S.S.R.										1						1
SWITZERLAND																1
AUSTRALIA									1							1
DENMARK														1		1
U.S. ORIGIN	14	9	7	6	7	14	19	22	19	23	24	26	37	31	28	286
U.S. CORP. OWNED	13	8	6	5	5	12	17	20	16	22	23	26	27	28	26	254
U.S. GOVT. OWNED	1	1	1	1	1	2	2	2	3	1	1	1	6	2	1	10
U.S. INDIV. OWNED													4	2	1	8
FOREIGN OWNED	4	2	2	1	2	3	6	4	5	8	6	14	16	23	14	110
FOREIGN ORIGIN	4	2	2	1	2	3	6	4	5	8	6	14	16	23	14	110
U.S. OWNED																
FOREIGN OWNED	4	2	2	1	1	2	5	4	5	6	4	11	13	22	12	94
FOREIGN CORP.	4	2	2	1	1	2	5	4	4	5	4	11	13	22	12	92
FOREIGN GOVT.																
FOREIGN INDIV.									1	1						2

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	15	11	6	16	26	22	26	30	21	41	42	34	52	16		358
U.S. ORIGIN	12	11	4	12	19	19	18	25	17	23	29	22	34	11		256
FOREIGN ORIGIN	3	1	2	4	7	3	8	5	4	18	13	12	18	5		102
GERMANY	2	1	1	2	3	1	3	2	2	6	6	5	9	4		46
JAPAN					2	1	1			4	4	5	4	1		21
UNITED KINGDOM	1			1	1	1	1			3	3	1	1			9
NETHERLANDS			1				1			3	3	1	1			10
FRANCE				1				1					1			4
CANADA									2	1			1			3
SWEDEN													1			1
ITALY								1				1				2
MEXICO								1								1
U.S.S.R.								1								2
SWITZERLAND							1									1
AUSTRALIA							1									1
DENMARK										1			1			1
U.S. ORIGIN	12	11	4	12	19	19	18	25	17	23	29	22	34	11		256
U.S. CORP. OWNED	11	7	4	10	18	18	16	23	16	22	26	15	30	11		227
U.S. GOVT. OWNED	1	1				1					1	4	2			9
U.S. INDIV. OWNED	1	2		2	1		2	2	1	1	2	3	1			18
FOREIGN OWNED													1			2
FOREIGN ORIGIN	3		2	4	7	3	8	5	4	18	13	12	18	5		102
U.S. OWNED	1		1	1	1	1	1	1	1	5	3	1	1	1		16
FOREIGN OWNED	2		1	3	7	2	7	5	3	13	10	11	18	4		86
FOREIGN CORP.	2		1	3	6	2	6	5	3	13	10	11	18	4		84
FOREIGN GOVT.																
FOREIGN INDIV.				1			1									2

187

II.C. IN VITRO CONVERSION - PROCESSES INVOLVING SYNTHESISGAS1. CONVERSION TO SYNTHESIS GAS

ASSIGNEES WITH 2 OR MORE PATENTS (1/69-12/78)

TEXACO INC.	59
TEXACO DEVELOPMENT CORPORATION	26
METALLGESELLSCHAFT AKTIENGESELLSCHAFT	19
EXXON RESEARCH + ENGINEERING CO.	17
CHEVRON RESEARCH COMPANY	12
SHELL OIL COMPANY	8
PULLMAN, INCORPORATED	7
COGAS DEVELOPMENT COMPANY	5
UNITED TECHNOLOGIES CORPORATION	5
LUMMUS COMPANY	5
GULF OIL CORPORATION	5
JAPAN GASOLINE CO., LTD.	5
BASF AKTIENGESELLSCHAFT	5
PHILLIPS PETROLEUM COMPANY	5
E. I. DU PONT DE NEMOURS AND COMPANY	4
MOBIL OIL CORPORATION	4
TOYO-KOGYO CO., LTD.	4
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	4
IMPERIAL CHEMICAL INDUSTRIES LIMITED	4
ENGELHARD MINERALS + CHEMICALS CORPORATION	3*
DR. C. OTTO COMP. G.M.B.H.	3
RALPH M. PARSONS COMPANY	3
TEXAS INSTRUMENTS, INCORPORATED	3
RUHRCHEMIE AG	3
UNION OIL COMPANY OF CALIFORNIA	3
FLUOR CORPORATION	3
MARATHON OIL COMPANY	2
CHEMICAL CONSTRUCTION CORPORATION	2
GENERAL ELECTRIC COMPANY	2
OCCIDENTAL PETROLEUM CORPORATION	2
GAS COUNCIL	2
HUTTENWERK OBERHAUSEN AG., FIRMA	2
FIERRO ESPONJA S.A.	2
CONTINENTAL OIL COMPANY	2
BETHLEHEM STEEL CORPORATION	2
ROCKWELL INTERNATIONAL CORPORATION	2
UNION CARBIDE CORPORATION	2
INSTITUTE OF GAS TECHNOLOGY	2
NIPPON KOKAN KABUSHIKI KAISHA	2
ALLIED CHEMICAL CORPORATION	2
UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM	2
UNITED STATES OF AMERICA, INTERIOR	2
MIDLAND-ROSS CORPORATION	2
UOP INC.	2

*Composite total, see Appendix A.

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS
 ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AIRCO INC.
 4106931 - METHODS FOR SINTERING POWDER METALLURGY PARTS

AIR PRODUCTS + CHEMICALS, INC.
 3779725 - COAL GASSIFICATION

ALLIED CHEMICAL CORPORATION
 4052555 - GASEOUS DIELECTRIC COMPOSITIONS
 4089805 - PROCESS FOR PREPARING A GASIFORM HYDROCARBON FUEL FROM HYDROCARBON FUEL OIL

AMERICAN OPTICAL CORPORATION
 3825500 - NEODYMIUM GLASS LASER HAVING ROOM TEMPERATURE OUTPUT AT WAVELENGTHS SHORTER THAN 1060 NM

A.P.C. (AZOTE ET PRODUITS CHIMIQUES) CATALYSTS + CHEMICALS E
 4089941 - STEAM REFORMER PROCESS FOR THE PRODUCTION OF HYDROGEN

ATLANTIC RICHFIELD COMPANY
 3620697 - APPARATUS AND METHOD FOR PRODUCING HYDROGEN

BAMAG VERFAHRENSTECHNIK GMBH
 4017272 - PROCESS FOR GASIFYING SOLID CARBONACEOUS FUEL

BASF AKTIENGESELLSCHAFT
 3838223 - STEAM REFORMING GASEOUS HYDROCARBONS
 3865753 - PROCESS FOR THE PREPARATION OF A NICKEL MAGNESIUM ALUMINUM CATALYST
 3912775 - CATALYST AND ITS USE FOR THE MANUFACTURE OF METHANE FROM GASES CONTAINING CARBON MONOXIDE AND DIOXIDE AND HYDROGEN
 3928460 - PRODUCTION OF COMBUSTION GAS TO HEAT SILVER CATALYST
 3941721 - CATALYST FOR THE MANUFACTURE OF GASES CONTAINING METHANE

BETHLEHEM STEEL CORPORATION
 3689575 - METHANOL SYNTHESIS
 3872025 - PRODUCTION AND UTILIZATION OF SYNTHESIS GAS

BRAUN, C. F., + COMPANY
 3549335 - AUTOTHERMAL REACTOR

BRAYTON CYCLE IMPROVEMENT ASSOCIATION
 3882671 - GASIFICATION METHOD WITH FUEL GAS COOLING

BRITISH GAS CORPORATION
 3938446 - PROCESS FOR THE PRODUCTION OF A SUBSTITUTE NATURAL GAS

BROKEN HILL PROPRIETARY COMPANY LIMITED
 4042844 - PROCESS FOR THE PRODUCTION OF GASEOUS MIXTURES

CAMERON ENGINEERS, INCORPORATED
 3963426 - PROCESS FOR GASIFYING CARBONACEOUS MATTER

CATALYSTS AND CHEMICALS INC.
 3420618 - GAS PURIFICATION BY HYDROGENATION

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

CENTRO SPERIMENTALE METALLURGICO S.P.A.
4048091 - PROCESS FOR THE PREPARATION OF REDUCING GASES
CHEMICAL CONSTRUCTION CORPORATION
3446747 - PROCESS AND APPARATUS FOR REFORMING HYDROCARBONS
3573224 - PRODUCTION OF HYDROGEN-RICH SYNTHESIS GAS
CHEMISCHE WERKE HULS, AG
3925490 - HYDROGENATION CATALYSTS AND PROCESS FOR THE REMOVAL OF ALDEHYDES AND KETONES FROM GASEOUS STREAMS RICH IN CARBON MONOXID
E

CHEM SYSTEMS INC.
3920716 - LIQUID PHASE METHANOL GASIFICATION

CHEVRON RESEARCH COMPANY
3576603 - HYDROGEN MANUFACTURE USING GAS TURBINE DRIVEN CENTRIFUGAL COMPRESSORS
3656905 - HYDROGEN MANUFACTURE
3698881 - SYNTHESIS GAS PRODUCTION
3719749 - HYDROGEN PRODUCTION
3759677 - CATALYTIC SYNTHESIS GAS MANUFACTURE
3765851 - GAS PRODUCTION
3775072 - GAS PRODUCTION
3801708 - HYDROGEN MANUFACTURE USING CENTRIFUGAL COMPRESSORS
3823227 - HYDROGEN MANUFACTURE
3850588 - PRODUCTION OF SYNTHESIS GAS RICH IN CARBON MONOXIDE
3874116 - SYNTHESIS GAS MANUFACTURE
3890432 - CATALYTIC HYDROGEN MANUFACTURE

CITIES SERVICE COMPANY
4040976 - PROCESS OF TREATING CARBONACEOUS MATERIAL WITH CARBON DIOXIDE

COGAS DEVELOPMENT COMPANY
3850839 - MANUFACTURE OF SYNTHESIS GAS
3966633 - WASTE WATER PROCESSING
3966634 - GASIFICATION METHOD
3968052 - SYNTHESIS GAS MANUFACTURE
3993563 - GASIFICATION OF ASH CONTAINING CARBONACEOUS SOLIDS

COMMODITY IMPROVEMENTS INC.
3634051 - ADDITIVES FOR COMBUSTIBLE FUELS

CONTINENTAL OIL COMPANY
3941820 - PREDOMINANTLY ALIPHATIC HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS
4120881 - PREDOMINANTLY ALIPHATIC LOWER HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS

DAIMLER-BENZ AKTIENGESELLSCHAFT
4067299 - SPLIT-GAS PRODUCTION FOR INTERNAL COMBUSTION ENGINE

DR. C. OTTO COMP. G.M.B.H.
4005045 - METHOD FOR CARRYING OUT ENDOTHERMIC CHEMICAL REACTIONS WITH THE USE OF NUCLEAR REACTOR COOLING GASES
4049570 - METHOD AND APPARATUS FOR REMOVING VAPORS AND AEROSOLS FROM GASES PRODUCED IN A GASIFICATION PLANT
4058420 - PROCESS FOR THE GASIFICATION OF SOLID FUELS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

DYNECOLOGY INCORPORATED
4052173 - SIMULTANEOUS GASIFICATION OF COAL AND PYROLYSIS OF ORGANIC SOLID WASTE MATERIALS

E. I. DU PONT DE NEMOURS AND COMPANY

- 3502596 - CERAMIC STRUCTURES
- 3763205 - METHANDL PROCESS WITH RECYCLE
- 3827987 - REFORMING PROCESS
- 3943236 - REFORMING PROCESS FOR CARBON MONOXIDE

EISENWERK-GESELLSCHAFT MAXIMILIANSHUTTE MBH

4062657 - METHOD AND APPARATUS FOR DESULPHURIZING IN THE GASIFICATION OF COAL

ENGELHARD INDUSTRIES, INC.

3481722 - PROCESS FOR PRODUCING HYDROGEN

ENGELHARD MINERALS + CHEMICALS CORPORATION

- 3595805 - STEAM REFORMING WITH PRELIMINARY HYDRODESULFURIZATION
- 4091086 - PROCESS FOR PRODUCTION OF HYDROGEN

EXXON RESEARCH + ENGINEERING CO.

- 3440177 - ASH REMOVAL IN GASIFICATION OF CARBONACEOUS SOLIDS
- 3475160 - METHOD OF PRODUCING FLUIDIZED BED REDUCTION OF ORES
- 3508873 - HYDROGEN PRODUCED IN AQUEOUS HYDROCARBON EMULSION MULTIBED REACTOR
- 3542532 - PROCESS FOR THE PRODUCTION OF HYDROGEN FROM PETROLEUM COKE
- 3615216 - WATER GAS SHIFT PROCESS FOR PRODUCING HYDROGEN USING CESIUM COMPOUND CATALYST
- 3755556 - LOW TEMPERATURE SHIFT REACTION INVOLVING AN ALKALI METAL COMPOUND AND A HYDROGENATION-DEHYDROGENATION COMPONENT
- 3816609 - PROCESS FOR PRODUCING A GASEOUS COMPOSITION CONTAINING HYDROGEN AND CARBON OXIDES
- 3838994 - CONVERSION OF HEAVY HYDROCARBONS TO A METHANE RICH GAS PRODUCT
- 3847566 - FLUIDIZED BED GASIFICATION PROCESS WITH REDUCTION OF FINES ENTRAINMENT BY UTILIZING A SEPARATE TRANSFER LINE BURNER STAG

E

3850742 - HYDROCARBON CRACKING IN A REGENERABLE MOLTEN MEDIA

- 3850841 - SHIFT PROCESS FOR NEW CATALYST
- 3852188 - HYDROCARBON CRACKING IN A REGENERABLE MOLTEN MEDIA
- 3876527 - HYDROCARBON CRACKING IN A REGENERABLE MOLTEN MEDIUM
- 3904744 - PROCESS FOR THE PRODUCTION OF HYDROGEN-CONTAINING GASES
- 3932146 - PROCESS FOR THE FLUID BED GASIFICATION OF AGGLOMERATING COALS
- 3985519 - HYDROGASIFICATION PROCESS
- 4075079 - PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM COAL

FIERRO ESPONJA S. A.

- 3765872 - METHOD AND APPARATUS FOR THE GASEOUS REDUCTION OF IRON ORE TO SPONGE IRON
- 3770421 - METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION

FIRMA CARL STILL

4050990 - METHOD AND APPARATUS FOR PRODUCING FORM COKE

FLUOR CORPORATION

- 3743488 - SYNTHESIS GAS GENERATION PROCESS
- 3795485 - SYNTHESIS GAS GENERATION APPARATUS
- 3859230 - SYNTHESIS GAS GENERATION WITH CARBON DIOXIDE SUPPLEMENTED FEED

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS
 ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING
 FORD, BACON + DAVIS TEXAS, INC.
 4051231 - PRODUCTION OF INTERNAL ATMOSPHERES FOR KILNS
 FOREST FUELS, INC.
 4095958 - APPARATUS AND METHOD FOR PRODUCING COMBUSTIBLE GASES FROM BIOMASS MATERIAL
 FRIED KRUPP HUTTENWERKE AG
 3923466 - APPARATUS FOR THE PRODUCTION OF CRACKED GAS
 GAS COUNCIL
 3591356 - PROCESS FOR THE PRODUCTION OF A GAS CONTAINING GASEDUS HYDROCARBONS
 3607158 - PROCESS FOR THE HYDROGENATION OF COAL
 GENERAL ELECTRIC COMPANY
 3547729 - COMPACT REACTOR-BOILER COMBINATION
 3607125 - REFORMER TUBE CONSTRUCTION
 GENERAL MOTORS CORPORATION
 3837905 - THERMAL OXIDATION OF SILICON
 GULF OIL CORPORATION
 3971635 - COAL GASIFIER HAVING AN ELUTRIATED FEED STREAM
 3971636 - CONDENSATE SCRUBBING OF COAL GASIFIER PRODUCT
 3971637 - COAL GASIFICATION PROCESS UTILIZING WASTE WATER FROM AN EXTERNAL PROCESS
 3971638 - COAL GASIFICATION PROCESS UTILIZING HIGH SULFUR CARBONACEOUS MATERIAL
 3971639 - FLUID BED COAL GASIFICATION
 HALDOR TOPSOE A/S
 3926583 - PROCESS FOR THE CATALYTIC STEAM REFORMING OF HYDROCARBONS
 HITACHI, LTD.
 4060498 - PROCESS FOR STEAM REFORMING OF HYDROCARBONS
 HORIZONS INCORPORATED, A DIVISION OF HORIZONS RESEARCH INCOR
 4074980 - PROCESS FOR PRODUCTION OF CARBON MONOXIDE AND HYDROGEN
 HUTTENWERK OBERHAUSEN AG., FIRMA
 3506590 - MANUFACTURE OF SYNTHESIS-, HYDROGENATING-, OR REDUCTION-GAS
 3536455 - PLANT FOR THE PRODUCTION OF METALLURGICAL REDUCING GAS
 HYDROCARBON RESEARCH INC.
 3775071 - METHOD FOR FEEDING DRY COAL TO SUPERATMOSPHERIC PRESSURE
 IDEMITSU KOSAN COMPANY LIMITED
 4089798 - PROCESS FOR PRODUCING REDUCING GAS
 IMPERIAL CHEMICAL INDUSTRIES LIMITED
 3488383 - DECOMPOSITION OF FORMIC ACID
 3650713 - STEAM REFORMING OF HYDROCARBONS
 3961037 - PROCESS FOR FORMING HYDROGEN AND CARBON DIOXIDE USING A CATALYST CONSISTING ESSENTIALLY OF OXIDES OF COPPER, ZINC AND ALUMINUM OR MAGNESIUM
 4072625 - STEAM-HYDROCARBON PROCESS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS
 ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

INSTITUTE OF GAS TECHNOLOGY
 3488171 - REFORMING AND SELECTIVE METHANATION OF HYDROCARBONS TO GENERATE HYDROGEN
 3488226 - PROCESS FOR GENERATION OF HYDROGEN FROM HYDROCARBONS AND USE THEREOF USE IN MOLTEN CARBONATE FUEL CELLS

JAPAN GASOLINE CO., LTD
 3518055 - HYDROCARBON REFORMING PROCESS
 3870738 - PROCESS FOR MANUFACTURING GASES RICH IN METHANE
 3992166 - LOW TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS
 4000987 - LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS
 4000988 - LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

KAPUSHIKI KAISHA TOYOTA CHUO KENKYUSHO
 4087259 - PROCESS FOR PARTIALLY OXIDIZING HYDROCARBONS

LA SOCIETE DITE SOCIETE CHIMIQUE DE LA GRANDE
 3644100 - APPARATUS FOR REFORMING HEAVY HYDROCARBONS

LEAS BROTHERS DEVELOPMENT CORPORATION
 3801288 - GASIFICATION REACTOR

LINDE AKTIENGESELLSCHAFT
 4019314 - HIGH PRESSURE GASIFICATION OF COAL USING NITROGEN DILUTION OF WASTE GAS FROM STEAM GENERATOR

LONZA LTD.
 3649189 - PREPARATION OF FINELY PARTICULATE SILICON OXIDES

LUMMUS COMPANY
 3475510 - ETHYLENE AND SYNTHESIS GAS PROCESS
 3479298 - PRODUCTION OF HYDROGEN
 3524819 - STEAM REFORMING OF HYDROCARBONS
 3527569 - STEAM REFORMING OF CARBON MONOXIDE RICH HYDROCARBON FEEDS
 3645701 - REFORMER FURNACE

MARATHON OIL COMPANY
 3676517 - PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS, CRACKED HYDROCARBON AND CALCINED COKE
 3855336 - PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS, CRACKED HYDROCARBON AND CALCINED COAL

MARQUARDT COMPANY
 4013428 - COAL GASIFICATION PROCESS

MASCHINENFABRIK AUGSBURG-NURNBERG AKTIENGESELLSCHAFT
 3912464 - METHOD OF AND DEVICE FOR SEPARATING SOLID COMPONENTS FROM A HOT COMBUSTIBLE GAS GENERATED IN A REACTOR

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 4113446 - GASIFICATION PROCESS

METALLGESELLSCHAFT AKTIENGESELLSCHAFT
 3540867 - PRODUCTION OF CARBON MONOXIDE AND HYDROGEN
 3720625 - PROCESS FOR PREPARING HYDROGEN OR NITROGEN AND HYDROGEN UNDER PRESSURE
 3726654 - PROCESS FOR GASIFYING HEAVY HYDROCARBONS
 3866353 - PROCESS FOR PRODUCING METHANE-RICH GASES FROM HYDROCARBONS
 3897471 - PROCESS FOR PRODUCING METHANOL

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING
(CONTINUED)

METALLGESELLSCHAFT AKTIENGESELLSCHAFT
3959972 - POWER PLANT PROCESS
3962300 - PROCESS FOR PRODUCING METHANOL
3963641 - PROCESS FOR INTERRUPTING NORMAL OPERATION OF A HYDROCARBON GASIFICATION REACTOR
3963642 - PROCESS FOR PRODUCING A REDUCING GAS
3979328 - AUTOMATIC CONTROL FOR PROCESS FOR THERMALLY GASIFYING HYDROCARBONS WITH OXYGEN AND WATER VAPOR
3988425 - PROCESS OF PRODUCING CARBON MONOXIDE FROM LIGHT HYDROCARBONS
4012404 - PROCESS FOR PRODUCING HIGH-METHANE GAS
4031030 - PROCESS FOR TREATING RAW GAS PRODUCED BY THE PRESSURE GASIFICATION OF COAL
4045960 - PROCESS FOR PRODUCING ENERGY
4056483 - PROCESS FOR PRODUCING SYNTHESIS GASES
4071332 - PROCESS OF GASIFYING SOLID FUELS, PARTICULARLY COAL
4087258 - PROCESS FOR PURIFYING RAW GAS FROM THE GASIFICATION OF SOLID FUELS
4087449 - PROCESS FOR PRODUCING METHANOL
4101376 - TUBULAR HEATER FOR CRACKING HYDROCARBONS

MIDLAND-ROSS CORPORATION

3617227 - APPARATUS FOR CATALYTIC REFORMING
3748120 - METHOD OF AND APPARATUS FOR REDUCING IRON OXIDE TO METALLIC IRON

MIFUJI IRON WORKS CO., LTD.

4049395 - METHOD FOR TREATING RAW MATERIAL WITH A TREATING GAS

MITSUBISHI CHEMICAL INDUSTRIES LTD.

3849087 - PROCESS FOR PRODUCING GASES BY THE CONVERSION OF HYDROCARBONS

MOBIL OIL CORPORATION

3972958 - CONVERSION OF COAL TO HIGH OCTANE GASOLINE
4046522 - PRE-ENGINE CONVERTER FOR USE WITH FUELS CONTAINING OXYGENATED COMPOUNDS
4093029 - UTILIZATION OF LOW BTU NATURAL GAS
4098339 - UTILIZATION OF LOW BTU NATURAL GAS

MONSANTO COMPANY

3761579 - HYDROGEN IODIDE

NIPPON KOKAN KABUSHIKI KAISHA

3909446 - METHOD OF MANUFACTURING HIGH QUALITY REDUCING GAS BY TWO STAGE REFORMING PROCESSES
4005986 - DEVICE FOR MAKING HIGH TEMPERATURE REFORMED GAS

NIPPON SOKEN, INC.

4110256 - CATALYST FOR REFORMING FUEL AND METHOD FOR PRODUCING SAME

NIPPON STEEL CORPORATION

3947234 - METHOD OF RAISING THE TEMPERATURE OF REDUCING GAS CONTAINING CO COMPONENT

NISSAN MOTOR CO., LTD.

4088450 - HYDROGEN GENERATOR

OCCIDENTAL PETROLEUM CORPORATION

3698882 - CONTINUOUS PROCESS FOR THE CONVERSION OF CARBONACEOUS SOLIDS INTO PIPELINE GAS
3846096 - GASIFICATION OF CARBONACEOUS SOLIDS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

OTTO CONSTRUCTION CORPORATION

3427253 - METHOD FOR PRODUCING CARBON MONOXIDE AND HYDROGEN FROM COAL DISTILLATION GAS

PHILLIPS PETROLEUM COMPANY

3552924 - HYDROGEN MANUFACTURE
 4011058 - PRODUCTION OF SUBSTITUTE NATURAL GAS FROM GASIFICATION OF COAL CHAR
 4070160 - GASIFICATION PROCESS WITH ZINC CONDENSATION ON THE CARBON SOURCE
 4071331 - PROCESS FOR PRODUCING METHANE FROM CARBON MONOXIDE AND STEAM
 4073630 - PRODUCTION OF CARBON MONOXIDE

PRITCHARD, J. F., AND COMPANY

3501516 - METHOD FOR PRODUCTION OF METHANOL

PULLMAN, INCORPORATED

3567411 - PROCESS FOR THE PRODUCTION OF GASEOUS PRODUCT CONTAINING HYDROGEN AND METHANE
 3567412 - GASIFICATION OF CARBONACEOUS FUELS
 3771261 - PROCESS FOR MAKING FUEL GAS
 3828474 - PROCESS FOR PRODUCING HIGH STRENGTH REDUCING GAS
 3862889 - PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS AND CLEAN FUELS
 4026823 - HYDROCARBON REFORMING CATALYST AND METHOD FOR PREPARING SAME
 4079017 - PARALLEL STEAM REFORMERS TO PROVIDE LOW ENERGY PROCESS

RALPH M. PARSONS COMPANY

3999961 - SULFUR CONTROL OVER CARBON FORMATION IN HIGH TEMPERATURE REFORMING OPERATIONS
 4050908 - PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM COAL
 4104191 - HYDROGEN GENERATION FROM FLUE GASES

ROCKWELL INTERNATIONAL CORPORATION

3916617 - PROCESS FOR PRODUCTION OF LOW BTU GAS
 4017271 - PROCESS FOR PRODUCTION OF SYNTHESIS GAS

RUHRCHEMIE AG

3578423 - PROCESS FOR CATALYTICALLY SPLITTING ISOBUTYRALDEHYDE TO PRODUCE CARBON MONOXIDE AND HYDROGEN
 4039584 - CATALYTIC CLEAVAGE OF ISOBUTYRALDEHYDE
 4048233 - PROCESS FOR PREPARING A SYNTHESIS GAS SUITABLE AS STARTING MATERIAL FOR THE OXO-SYNTHESIS

SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.

4060397 - TWO STAGE PARTIAL COMBUSTION PROCESS FOR SOLID CARBONACEOUS FUELS

SHELL OIL COMPANY

3810975 - START-UP PROCEDURE FOR CATALYTIC STEAM REFORMING OF HYDROCARBONS
 3868331 - PROCESS FOR THE PARTIAL COMBUSTION OF HYDROCARBONACEOUS FUELS TO PRODUCE SUBSTANTIALLY SOOT-FREE GASES
 3917468 - SYNTHETIC NATURAL GAS PRODUCTION
 3957962 - PROCESS FOR THE PREPARATION OF HYDROGEN-RICH GAS
 3964882 - PARTIAL COMBUSTION PROCESS
 3972690 - GASIFICATION PROCESS
 4007129 - PARTIAL COMBUSTION PROCESS FOR MANUFACTURING A PURIFIED GAS CONTAINING HYDROGEN AND CARBON MONOXIDE
 4094813 - PROCESS AND APPARATUS FOR THE MANUFACTURE AND COOLING OF GASES CONTAINING HYDROGEN AND CARBON MONOXIDE

SIEMENS AKTIENGESELLSCHAFT

3454364 - USE OF RANEY NICKEL FOR OBTAINING HYDROGEN

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

SNAM PROGETTI S.P.A.

3813229 - PROCESS FOR THE PRODUCTION OF A REDUCING GAS FOR BLAST FURNACE

SOCIETE ANONYME SOCIETE TECHNIQUE D ENTREPRISES CHEMIQUES

3486327 - PROCESS FOR TREATING GASEOUS MIXTURES

SOCIETE CHIMIQUE DE LA GRANDE PAROISSE.

3737291 - PROCESS FOR REFORMING HEAVY HYDROCARBONS

STAMICARBON N.V.

3687866 - PROCESS OF PREPARING SYNTHESIS GAS

STONE + WEBSTER ENGINEERING CORPORATION

3858951 - CONVECTIVE POWER REFORMER EQUIPMENT AND SYSTEM

STORA KOPPARBERGS BERGSLAGS AB

4026679 - APPARATUS FOR AND PROCESS OF CONVERTING CARBONACEOUS MATERIALS CONTAINING SULPHUR TO AN ESSENTIALLY SULPHUR-FREE COMBUSTIBLE GAS

SUN RESEARCH AND DEVELOPMENT COMPANY

3770399 - COAL GASIFICATION PROCESS

TEXACO DEVELOPMENT CORPORATION

3851347 - OXIDATION PROCESS WITH IMPROVED WASTE HEAT BOILER

3620699 - REDUCING GAS GENERATION

3705108 - SYNTHESIS GAS GENERATION

3723344 - OXO-SYNTHESIS GAS

3723345 - SYNTHESIS GAS PROCESS

3738940 - METHOD OF OPERATING A BURNER FOR THE PARTIAL OXIDATION OF HYDROCARBONS TO SYNTHESIS GAS

3743606 - SYNTHESIS GAS GENERATION

3767379 - ORE REDUCTION PROCESS USING RECIRCULATED COOLANT GAS

3816332 - SYNTHESIS GAS PRODUCTION

3847564 - APPARATUS AND PROCESS FOR BURNING LIQUID HYDROCARBONS IN A SYNTHESIS GAS GENERATOR

3907703 - PROCESS FOR PRODUCING REDUCING GAS

3919113 - OXO-SYNTHESIS GAS

3919114 - SYNTHESIS GAS PROCESS

3920717 - PRODUCTION OF METHANOL

3922148 - PRODUCTION OF METHANE-RICH GAS

3945942 - FUEL BURNER AND PROCESS FOR GAS MANUFACTURE

3980590 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

3980591 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

3980592 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

4016102 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

4016103 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

4016104 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS

4081253 - PRODUCTION OF PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE

4099932 - CONVERSION OF SOLID FUELS TO FLUID FUELS

4110359 - PRODUCTION OF CLEANED AND PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE

4113445 - PROCESS FOR THE PARTIAL OXIDATION OF LIQUID HYDROCARBONACEOUS FUELS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS
 ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

TEXACO INC.
 3473903 - RECOVERY OF CARBON FROM SYNTHESIS GAS
 3485882 - STEAM-HYDROCARBON PROCESS OVER IRON-CHROMIUM CATALYST FOR SYNTHESIS GAS PRODUCTION
 3520823 - SYNTHESIS GAS PROCESS
 3528930 - PRODUCTION OF SYNTHESIS GAS
 3544291 - COAL GASIFICATION PROCESS
 3545926 - PRODUCTION OF SYNTHESIS GAS AND HYDROGEN
 3556751 - PRODUCTION OF SYNTHESIS GAS
 3574578 - STEAM HYDROCARBON REFORMING PROCESS
 3595619 - SHIFT CONVERSION PROCESS FOR PRODUCTION OF HYDROGEN
 3607156 - HYDROGEN AND CARBON MONOXIDE FROM SLURRIES OF SOLID CARBONIFEROUS FUELS
 3607157 - SYNTHESIS GAS FROM PETROLEUM COKE
 3615297 - CARBON RECOVERY PROCESS
 3620698 - HYDROGEN AND CARBON MONOXIDE FROM SLURRIES OF SOLID CARBONIFEROUS FUELS
 3620700 - RECOVERY OF ENTRAINED CARBON IN SYNTHESIS GAS
 3639261 - PROCESS FOR THE GENERATION OF SYNTHESIS GAS FROM OIL
 3652454 - HIGH PRESSURE WATER-GAS SHIFT CONVERSION PROCESS
 3666423 - HEAT EXCHANGE APPARATUS
 3666682 - WATER-GAS SHIFT CONVERSION PROCESS
 3694373 - PRODUCTION OF REDUCING GAS
 3709669 - METHANE PRODUCTION
 3725270 - POLLUTION ABATEMENT PROCESS FOR REFINERY WASTE WATER
 3740204 - PROCESS FOR THE PRODUCTION OF METHANE FROM CARBONACEOUS FUELS
 3752771 - SYNTHESIS GAS PRODUCTION BY PARTIAL OXIDATION
 3759837 - SYNTHESIS GAS PRODUCTION BY PARTIAL OXIDATION
 3764547 - SLURRIES OF SOLID CARBONIFEROUS FUELS
 3784364 - PRODUCTION OF FUEL GAS
 3796947 - HEAT EXCHANGE APPARATUS FOR CATALYTIC SYSTEM
 3825501 - EXOTHERMIC REACTION PROCESS
 3840355 - PARTIAL OXIDATION OF HYDROCARBONS TO SYNTHESIS GAS
 3846095 - REDUCING GAS GENERATION
 3866411 - GAS TURBINE PROCESS UTILIZING PURIFIED FUEL AND RECIRCULATED FLUE GASES
 3868817 - GAS TURBINE PROCESS UTILIZING PURIFIED FUEL GAS
 3884648 - PROCESS FOR MAKING A REDUCING GAS
 3890113 - PRODUCTION OF METHANE
 3920579 - SYNTHESIS GAS PRODUCTION BY PARTIAL OXIDATION
 3927997 - METHANE-RICH GAS PROCESS
 3927998 - METHANE-RICH GAS PROCESS
 3927999 - METHANE-RICH GAS PROCESS
 3928000 - PRODUCTION OF A CLEAN METHANE-RICH FUEL GAS FROM HIGH-SULFUR CONTAINING HYDROCARBONACEOUS MATERIALS
 3928001 - PRODUCTION OF METHANE
 3929429 - FUEL GAS FROM SOLID CARBONACEOUS FUELS
 3951617 - PRODUCTION OF CLEAN FUEL GAS
 3957682 - PREPARATION OF METHANE, HYDROGEN AND CARBON MONOXIDE CONTAINING GASES
 3976442 - SYNTHESIS GAS FROM GASEOUS CO/2\ -SOLID CARBONACEOUS FUEL FEEDS
 3976443 - SYNTHESIS GAS FROM SOLID CARBONACEOUS FUEL
 3996026 - PROCESS FOR FEEDING A HIGH SOLIDS CONTENT SOLID FUEL-WATER SLURRY TO A GASIFIER
 3998609 - SYNTHESIS GAS GENERATION
 4006099 - MANUFACTURE OF GASEOUS MIXTURES COMPRISING HYDROGEN AND CARBON MONOXIDE
 4006100 - MANUFACTURE OF GASEOUS MIXTURES COMPRISING HYDROGEN AND CARBON MONOXIDE
 4007015 - APPARATUS USEFUL FOR THE PRODUCTION OF HYDROGEN
 4007018 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS
 4007019 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING (CONTINUED)

TEXACO INC.
 4021366 - PRODUCTION OF HYDROGEN-RICH GAS
 4046868 - STEAM REFORMING PROCESS
 4074981 - PARTIAL OXIDATION PROCESS
 4083799 - METHOD OF STEAM REFORMING
 4099382 - BY-PRODUCT SUPERHEATED STEAM FROM THE PARTIAL OXIDATION PROCESS
 4099383 - PARTIAL OXIDATION PROCESS
 4121912 - PARTIAL OXIDATION PROCESS WITH PRODUCTION OF POWER

TEXAS INSTRUMENTS, INCORPORATED
 3505018 - REFORMING HYDROCARBON FUELS
 3619144 - APPARATUS FOR REFORMING HYDROCARBON FUELS TO PRODUCE HYDROGEN
 3685977 - PARTIAL OXIDATION OF HYDROCARBONS

THAGARD TECHNOLOGY COMPANY
 4059416 - CHEMICAL REACTION PROCESS UTILIZING FLUID-WALL REACTORS

TOHOKU UNIVERSITY
 4005995 - PROCESS FOR PRODUCING A GASEOUS PRODUCT FROM CARBONACEOUS MATERIAL

TOTAL ENERGY CORPORATION
 3692506 - HIGH BTU GAS CONTENT FROM COAL

TOYO-KOGYO CO., LTD.
 3582296 - GASIFYING PROCESS
 3953396 - METHOD OF PRODUCING GASEOUS MIXTURE RICH IN HYDROGEN
 3957681 - PROCESS FOR MANUFACTURING GASEOUS MIXTURES RICH IN HYDROGEN
 4025457 - PROCESS FOR MANUFACTURING GASEOUS MIXTURES RICH IN HYDROGEN

UNION CARBIDE CORPORATION
 4017273 - PYROLYSIS PROCESS FOR CONVERTING REFUSE TO FUEL GAS
 4042345 - PROCESS FOR CONVERSION OF SOLID REFUSE TO FUEL GAS USING PELLETIZED REFUSE FEED

UNION OIL COMPANY OF CALIFORNIA
 3539298 - PRODUCTION OF HYDROGEN FROM CARBON MONOXIDE AND WATER UNDER LIQUID PHASE REACTION CONDITIONS IN THE PRESENCE OF A BASIC NITROGEN COMPOUND
 4024171 - ALUMINUM BORATE CATALYST COMPOSITIONS AND USE THEREOF IN CHEMICAL CONVERSIONS
 4124629 - THERMALLY STABLE COPRECIPITATED CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS

UNION RHEINISCHE BRAUNKOHLEN KRAFFTSTOFF AKTIENGESELLSCHAFT
 3690550 - PROCESS FOR TRANSPORTING THERMAL ENERGY

UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
 3945809 - METHOD AND APPARATUS FOR REMOVING COARSE UNENTRAINED CHAR PARTICLES FROM THE SECOND STAGE OF A TWO-STAGE COAL GASIFIER
 3988123 - GASIFICATION OF CARBONACEOUS SOLIDS
 3989480 - DECOMPOSITION OF CARBOHYDRATE WASTES
 3993458 - METHOD FOR PRODUCING SYNTHETIC FUELS FROM SOLID WASTE

UNITED STATES OF AMERICA, INTERIOR
 3594329 - REGENERATION OF ZINC CHLORIDE CATALYST
 4087373 - NOVEL METHOD FOR THE PRODUCTION OF HYDROGEN AND HYDROGEN-CARBON MONOXIDE MIXTURES

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND SPACE ADM

3971847 - HYDROGEN-RICH GAS GENERATOR

3982910 - HYDROGEN-RICH GAS GENERATOR

UNITED STATES OF AMERICA, NAVY

3553273 - BIS(FLUORODINITROMETHYL)ALKYLENE DIOLS

UNITED STATES STEEL CORPORATION

4047935 - PROCESS FOR DIRECT-REDUCTION OF IRON-ORE EMPLOYING NUCLEAR REACTOR-POWDERED CATALYTIC REFORMER

UNITED TECHNOLOGIES CORPORATION

3442618 - METHOD FOR PRODUCING HYDROGEN FROM HYDROGEN-CONTAINING FEEDSTOCKS

3448994 - METHOD FOR GENERATING HYDROGEN-CONTAINING FEEDSTOCKS

3450500 - METHOD FOR CATALYTICALLY REFORMING HYDROGEN-CONTAINING CARBONACEOUS FEEDSTOCKS BY SIMULTANEOUS ABSTRACTIONS THROUGH A MEMBRANE SELECTIVELY PERMEABLE TO HYDROGEN

3531263 - INTEGRATED REFORMER UNIT

4071330 - STEAM REFORMING PROCESS AND APPARATUS THEREFOR

UNIVERSITY OF ILLINOIS FOUNDATION

4004896 - PRODUCTION OF WATER GAS

UNIVERSITY OF ROCHESTER

4107076 - CATALYST SYSTEM FOR CATALYZING THE WATER GAS SHIFT REACTION

UOP INC.

3859428 - PRODUCTION OF HYDROGEN

4010008 - SUBSTITUTED NATURAL GAS VIA HYDROCARBON STEAM REFORMING

WESTINGHOUSE ELECTRIC CORP.

4021298 - CONVERSION OF COAL INTO HYDROCARBONS

SYNTHETIC FUELS II C 1- IN VITRO - CONVERSION TO SYNTHESIS GAS
 UNASSIGNED PATENTS (1/76-12/78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
CAUGHEY	ROBERT A. CLINTON ROAD	ANTRIM	NH	03440
CROUCH	4030895 - APPARATUS FOR PRODUCING COMBUSTIBLE GASES FROM CARBONACEOUS MATERIALS WILLIAM B. C/O TEXACO INC. P.O. BOX 400	MONTEBELLO	CA	90640
ERICKSON	4007017 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS DONALD C. 1704 S. HARBOR LA.	ANNAPOLIS	MD	21401
ESTABROOK	4126668 - PRODUCTION OF HYDROGEN RICH GAS BY COMBINED STEAM REFORMING AND INTERMEDIATE OXIDATION-REDUCTION LAWRENCE E. C/O TEXACO INC. P.O. BOX 400	MONTEBELLO	CA	90640
FUNK	4007017 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS HAROLD F. 68 ELM ST.	MURRAY HILL	NJ	07974
RECHTER	3970524 - TREATING WASTE MATERIALS TO PRODUCE USABLE GASES GEORGE N. C/O TEXACO INC. P.O. BOX 400	MONTEBELLO	CA	90640
SLATER	4007017 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS WILLIAM L. C/O TEXACO INC. P.O. BOX 400	MONTEBELLO	CA	90640
SQUIRES	4007017 - PRODUCTION OF CLEAN SYNTHESIS OR FUEL GAS ARTHUR M. 245 W. 104 ST.	NEW YORK	NY	10025
VAN SLYKE	3957457 - GASIFYING COAL OR COKE AND DISCHARGING ASH AGGLOMERATES 3957458 - GASIFYING COAL OR COKE AND DISCHARGING SLAG FRIT WILLIAM J. 2549 HARRIS AVE.	RICHLAND	WA	99352
	3977844 - PROCESS FOR PRODUCING A SULFUR FREE COMBUSTIBLE GAS			

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3424695 - IMPROVING REFORMER-FURNACE PERFORMANCE BY USING GAS-TURBINE EXHAUST	3097081	3103423	3115394	3119667
3469944 - PROCESS AND APPARATUS FOR THE MANUFACTURE OF HYDROGEN	3097081	3177150	3193378	3197293
3515514 - PRODUCTION OF HYDROGEN CONTAINING GASES	3173784	3232726	3241933	3262758
3519546 - METHOD OF INCREASING THE ACTIVITY OF A CATALYST IN THE OXIDATION OF CARBON MONOXIDE	3232727	3343908	3351563	3388074
3655172 - SATURATED FLUID MIXTURES GENERATOR	3312634	3317275	3343908	3345136
3684689 - PROCESS FOR PRODUCING LIGHT PRODUCTS FROM HEAVY HYDROCARBONS	3305312	3312634	3317275	3343908
3687646 - SEWAGE DISPOSAL PROCESS	3397962	3410661	3418082	
3688438 - PRODUCTION OF A METHANE-RICH SYNTHESIS GAS				
3715195 - MULTI-HYDROTORTING OF COAL				
3751228 - APPARATUS FOR REFORMING HYDROCARBONS UNDER PRESSURE				
3850840 - WATER GAS SHIFT PROCESS				
3071453	3072469	3073672	3088919	3090684
3132010	3136623	3136624	3136625	3147093
3206334	3208830	3214236	3214266	3222132
3271325	3278268	3303017	3305312	3312634
3393979	3394086	3395004	3397962	3410661

II.C. IN VITRO CONVERSION: PROCESSES INVOLVING SYNTHESIS GAS
I. CONVERSION TO SYNTHESIS GAS

PATENTING UPDATE (1/79-8/79)

<u>Patent No.</u>	<u>Assignee & Title</u>
4,134,740	<u>Texaco Inc.:</u> Method For Energy Utilization In Producing Synthesis Gas And Recovering Unconverted Carbon
4,140,493	<u>Phillips Petroleum Company:</u> Hydrocarbon Steam Reforming Process
4,141,695	<u>Texaco, Inc.:</u> Process For Gas Cleaning With Reclaimed Water
4,141,696	<u>Texaco, Inc.:</u> Process For Gas Cleaning With Reclaimed Water And Apparatus For Water Reclamation
4,142,988	<u>Imperial Chemical Industries Ltd:</u> Carbon Monoxide Shift Process
4,146,369	<u>Projektierung Chemische Verfahrenstechnik GmbH:</u> Process For Gas Production From Solid Fuels
4,147,660	<u>Osaka Gas Company, Ltd.:</u> Method For Reactivation Of Platinum Group Metal Catalyst With Aqueous Alkaline And/Or Reducing Solutions
4,149,859	<u>Shell Internationale Research Maatschappij B.V.:</u> Process For Cooling And Separation Of Dry Particulate Matter From A Hot Gas
4,151,107	<u>Monsanto Company:</u> Catalysis Of Water- Gas Shift Reaction
4,152,119	<u>Dynecology Inc.:</u> Briquette Comprising Caking Coal And Municipal Solid Waste
4,153,580	<u>United Catalysts Inc.:</u> CO-Conversion Catalysts
4,154,582	<u>General Electric Company:</u> Method Of Solids Discharge From Coal Gasifier Grate
4,156,659	<u>United States Steel Corporation:</u> Method Of Manufacturing A Reducing Gas Useful In A Direct Reduction Process
4,161,393	<u>Metallgesellschaft Aktiengesellschaft:</u> Shift Conversion Of Raw Gas From Gasification of Coal
4,161,510	<u>Chevron Research Company:</u> Reforming Furnace Having Ceramic Coated Tubes
4,166,101	<u>Emmanuel E. A. Neel; Michael Deflin; Jacques Vanrenterghem & Jean Claude Clement all of Grand Courrone, France:</u> Process Of The Preparation Of A Hydrogen-Rich Gas And The Catalyst Used In The Process

II. C. IN VITRO CONVERSION: PROCESSES INVOLVING SYNTHESIS GAS

2. REACTING SYNTHESIS GAS

This profile includes processes which are directed to the reaction of CO and/or CO₂ with H₂, i.e., the reaction of synthesis gas, to form one or more carbon compounds, such as, gaseous hydrocarbons (methanization), or liquid hydrocarbons ("Fischer-Tropsch" synthesis) or oxygenated compounds (methanol). Processes may also include the conversion of a starting material to synthesis gas as a first step.

INCLUDED IN THIS PROFILE ARE ALL OF THE PATENTS FROM:

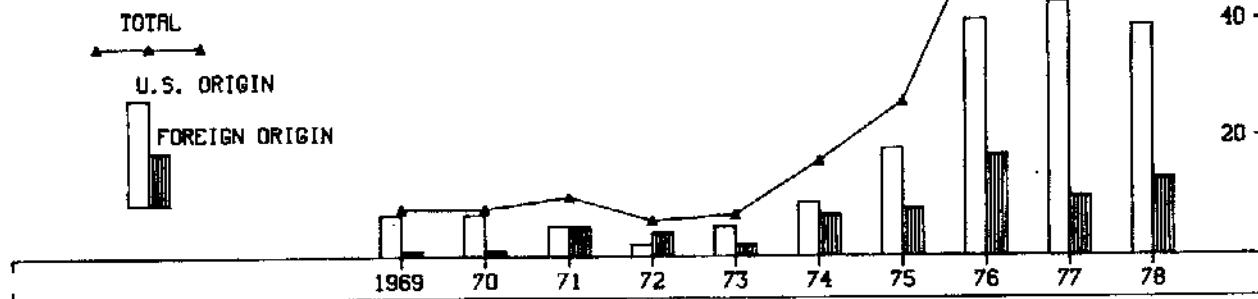
Class 260, Subclasses 449L-450

ACTIVITY INDICES (1976-1978)

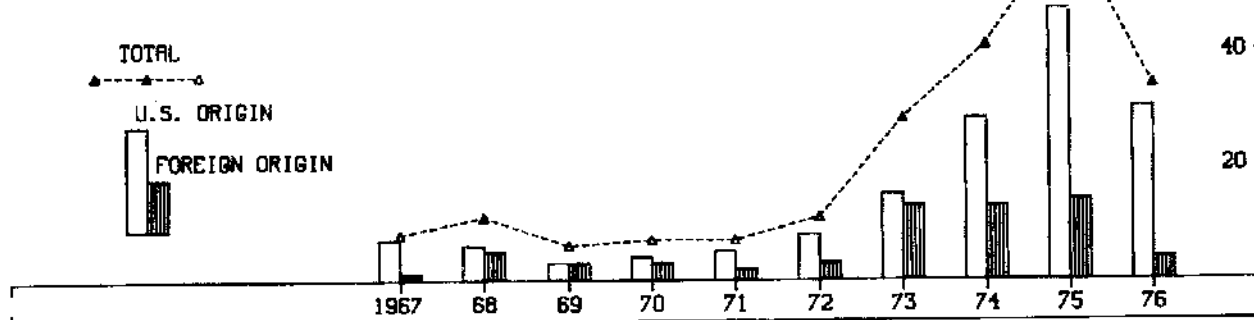
GROWTH	66.7%
FOREIGN SHARE	24.7%
CORPORATE OWNED	95.1%
GOVERNMENT OWNED	3.1%
U.S. OWNED OF FOREIGN	2.5%

PATENT ACTIVITY

BY PATENT GRANT DATE
1969-1978



BY APPLICATION FILING DATE
1967-1976



SYNTHETIC FUELS

II C 2- IN VITRO - REACTING SYNTHESIS GAS

PATENT ACTIVITY (1963-1978) BY DATE OF PATENT GRANT

PAGE A 2

	63-64	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	5	2	7	6	8	8	8	10	6	7	16	26	57	53	52	271
U.S. ORIGIN	2	2	6	3	6	7	7	5	2	5	9	18	40	43	39	194
FOREIGN ORIGIN	3		1	3	2	1	1	5	4	2	7	8	17	10	13	77
GERMANY	2			2					1		1	4	7	6	4	27
UNITED KINGDOM	1		1	1	1	1	1	3	2		1	4	7	4	1	22
JAPAN								1	1		4	2	2			12
FRANCE																5
ITALY																4
DENMARK								1		1						2
U.S.S.R.					1											1
NETHERLANDS										1						1
RHODESIA												1				1
CANADA																1
U.S. ORIGIN	2	2	6	3	6	7	7	5	2	5	9	18	40	43	39	194
U.S. CORP. OWNED	1	2	5	3	5	6	7	5	2	5	7	15	35	42	38	178
U.S. GOVT. OWNED			1		1	1					2	1	4	1	1	10
U.S. INDIV. OWNED	1															4
FOREIGN OWNED					1						1	1	1	1		4
FOREIGN ORIGIN	3		1	3	2	1	1	5	4	2	7	8	17	10	13	77
U.S. OWNED	1							1			1	1	1			5
FOREIGN OWNED	2		1	3	2	1	1	4	4	2	6	7	16	10	13	72
FOREIGN CORP.	1		1	3	2	1	1	2	3	1	5	6	16	10	12	65
FOREIGN GOVT.								1								1
FOREIGN INDIV.	1							1	1	1					1	6

204

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

PATENT ACTIVITY (PATENTS GRANTED 1/67-12/78) BY DATE OF PATENT APPLICATION

PAGE A 4

	PRE 65	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	TOTAL
TOTAL	7	8	4	8	11	6	7	7	11	28	41	61	34	24		257
U.S. ORIGIN	5	5	3	7	6	3	4	5	8	15	28	47	30	18		184
FOREIGN ORIGIN	2	3	1	1	5	3	3	2	3	13	13	14	4	6		73
GERMANY		2			1				2	4	5	7	2	2		25
UNITED KINGDOM	1	1		1	2	2	1		1	2	5	4	1			21
JAPAN			1		1	1		2		5	1					11
FRANCE							1				1		1	3		5
ITALY					1							1				3
DENMARK	1											2		1		3
U.S.S.R.							1			1						2
NETHERLANDS											1					1
RHODESIA										1						1
CANADA																1
U.S. ORIGIN	5	5	3	7	6	3	4	5	8	15	28	47	30	18		184
U.S. CORP. OWNED	5	3	3	7	6	3	4	5	5	13	26	43	30	17		170
U.S. GOVT. OWNED		1							2	1	1	3		1		9
U.S. INDIV. OWNED									1	1		1				3
FOREIGN OWNED	1										1					2
FOREIGN ORIGIN	2	3	1	1	5	3	3	2	3	13	13	14	4	6		73
U.S. OWNED					1				1	2						4
FOREIGN OWNED	2	3	1	1	4	3	3	2	2	11	13	14	4	6		69
FOREIGN CORP.																
FOREIGN GOVT.	2	3	1	1	1	3	2	2	2	11	12	14	4	5		63
FOREIGN INDIV.					1		1									1
					2		1				1			1		5

II.C. IN VITRO CONVERSION - PROCESSES INVOLVING SYNTHESIS
GAS

2. REACTING SYNTHESIS GAS

ASSIGNEES WITH 2 OR MORE PATENTS (1/69-12/78)

MOBIL OIL CORPORATION	32*
UNION CARBIDE CORPORATION	18
EXXON RESEARCH + ENGINEERING CO.	13
METALLGESELLSCHAFT AKTIENGESELLSCHAFT	10
IMPERIAL CHEMICAL INDUSTRIES LIMITED	10
TEXACO INC.	9
UNION OIL COMPANY OF CALIFORNIA	8
TEXACO DEVELOPMENT CORPORATION	7
SHELL OIL COMPANY	7
CONTINENTAL OIL COMPANY	6
PHILLIPS PETROLEUM COMPANY	6
BASF AKTIENGESELLSCHAFT	4
CHEVRON RESEARCH COMPANY	4
GULF RESEARCH + DEVELOPMENT COMPANY	4
GAS COUNCIL	4
UNITED STATES OF AMERICA, INTERIOR	4
MONSANTO COMPANY	4
RALPH M. PARSONS COMPANY	4*
PULLMAN, INCORPORATED	3
UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY	3
CHEM SYSTEMS INC.	3
KRUPP KOPPERS GMBH	3
BRITISH GAS CORPORATION	3
MITSUBISHI GAS-CHEMICAL COMPANY, INC.	3
BATTELLE DEVELOPMENT CORPORATION	3
E. I. DU PONT DE NEMOURS AND COMPANY	3
INSTITUTE OF GAS TECHNOLOGY	2
ETHYL CORPORATION	2
HALDOR TOPSOE A/S	2
CLEANESE CORPORATION	2
CHEMICAL CONSTRUCTION CORPORATION	2
UOP INC.	2
BETHLEHEM STEEL CORPORATION	2
SAGAMI CHEMICAL RESEARCH CENTER	2
INSTITUT FRANCAIS DU PETROLE DES CARBURANTS ET LUBRIFIANTS A	2
JAPAN GASOLINE CO., LTD.	2

*Composite total, see Appendix A.

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

AIR PRODUCTS + CHEMICALS, INC.

4131568 - CATALYTIC SYNTHESIS OF LOW MOLECULAR WEIGHT HYDROCARBONS

AJINOMOTO CO., INC.

3816513 - PROCESS FOR PRODUCING METHYL FORMATE

ARMOUR PHARMACEUTICAL COMPANY

3499963 - CODRIED ALUMINUM HYDROXIDE-ALUMINUM CHELATE ANTACID

BASF AKTIENGESELLSCHAFT

3865753 - PROCESS FOR THE PREPARATION OF A NICKEL MAGNESIUM ALUMINUM CATALYST

3912775 - CATALYST AND ITS USE FOR THE MANUFACTURE OF METHANE FROM GASES CONTAINING CARBON MONOXIDE AND DIOXIDE AND HYDROGEN

3941721 - CATALYST FOR THE MANUFACTURE OF GASES CONTAINING METHANE

3950368 - MANUFACTURE OF METHANE

BATTELLE DEVELOPMENT CORPORATION

3997582 - PROCESS AND CATALYST FOR SYNTHESIZING A GASEOUS HYDROCARBON MIXTURE HAVING A HIGH METHANE CONTENT FROM CARBON MONOXIDE AND HYDROGEN

4039302 - PROCESS AND CATALYST FOR SYNTHESIZING LOW BOILING (C1 TO C3) ALIPHATIC HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

4077995 - PROCESS FOR SYNTHESIZING LOW BOILING ALIPHATIC HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

BECHTEL ASSOCIATES PROFESSIONAL CORPORATION

4017274 - PROCESS FOR THE METHANATION OF GASES CONTAINING HIGH CONCENTRATION OF CARBON MONOXIDE

BETHLEHEM STEEL CORPORATION

3689575 - METHANOL SYNTHESIS

3872025 - PRODUCTION AND UTILIZATION OF SYNTHESIS GAS

BRITISH GAS CORPORATION

3933446 - PROCESS FOR THE PRODUCTION OF A SUBSTITUTE NATURAL GAS

3942958 - COMPOSITION CONTROL OF GASES

4105591 - METHOD OF PREPARING AND FILTERING COPRECIPITATED NICKEL-ALUMINA CATALYSTS

CATALYSTS AND CHEMICALS INC.

3949566 - SPHERICAL METHANATION CATALYSTS

CELANESE CORPORATION

4089886 - METHANOL PURIFICATION

4101450 - CATALYST FOR PRODUCTION OF ACETIC ACID

CHEMICAL CONSTRUCTION CORPORATION

3446747 - PROCESS AND APPARATUS FOR REFORMING HYDROCARBONS

3531266 - PRODUCTION OF SYNTHETIC METHANOL

CHEM SYSTEMS INC.

3888896 - METHANOL PRODUCTION

3920716 - LIQUID PHASE METHANOL GASIFICATION

4031123 - METHANOL PRODUCTION IN A PARAFFINIC MEDIUM

CHEVRON RESEARCH COMPANY

3907519 - GASIFICATION OF SOLID CARBONACEOUS MATERIALS TO OBTAIN HIGH BTU PRODUCT GAS

3986349 - METHOD OF POWER GENERATION VIA COAL GASIFICATION AND LIQUID HYDROCARBON SYNTHESIS

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

CHEVRON RESEARCH COMPANY
4087470 - PROCESS FOR THE PRODUCTION OF ETHYLENE GLYCOL (CONTINUED)
4092825 - PROCESS FOR BASE-LOAD AND PEAK-LOAD POWER GENERATION

CONOCO METHANATION COMPANY
4127392 - METHANATION PROCESS START-UP

CONTINENTAL OIL COMPANY
3932552 - INTEGRATED PROCESS FOR PRODUCING C/2 \ HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN
3941820 - PREDOMINANTLY ALIPHATIC HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS
3965045 - IRON CATALYST
3977843 - PURIFICATION PROCESS FOR COAL GAS METHANATION
4120881 - PREDOMINANTLY ALIPHATIC LOWER HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS
4123446 - ADIABATIC REACTOR

DAVY POWERGAS LIMITED
3930812 - METHANE SYNTHESIS

E. I. DU PONT DE NEMOURS AND COMPANY
3763205 - METHANOL PROCESS WITH RECYCLE
4111847 - METHANOL SYNTHESIS CATALYST
4131616 - METHANATION CATALYST

ELECTRICITE DE FRANCE SERVICE NATIONAL
4092129 - PROCESS FOR PRODUCING METHANE RICH GAS

EL PASO NATURAL GAS COMPANY
4005996 - METHANATION PROCESS FOR THE PRODUCTION OF AN ALTERNATE FUEL FOR NATURAL GAS

ETHYL CORPORATION
3493610 - PREPARATION OF FORMIC ACID SALTS
4116996 - CATALYST FOR METHANE PRODUCTION
EXXON RESEARCH + ENGINEERING CO.
3450514 - CONTROLLED CONVERSION OF LIGHT NAPHTHA TO TOWN GAS
3617518 - INHIBITION OF HYDROGENOLYSIS
3816298 - HYDROCARBON CONVERSION PROCESS
3901667 - MANUFACTURE OF METHANE-CONTAINING GASES USING AN INTEGRATED FLUID COKING AND GASIFICATION PROCESS
3941819 - CATALYTIC FORMATION OF HYDROCARBONS FROM CO H/2 \ MIXTURES
3946082 - PREPARATION OF ZEROVALENT PHOSPHINE SUBSTITUTED RHODIUM COMPOUNDS AND THEIR USE IN THE SELECTIVE CARBONYLATION OF OLEFIN S

3958957 - METHANE PRODUCTION
3993457 - CONCURRENT PRODUCTION OF METHANOL AND SYNTHETIC NATURAL GAS
4041087 - METHOD FOR THE DIRECT PREPARATION OF HALOGENATED HYDROCARBONS BY THE REACTION OF CO, H/2 \ AND HALOGEN IN THE PRESENCE OF F A CATALYST

4042614 - HYDROCARBON SYNTHESIS FROM CO AND H/2 \ USING RU SUPPORTED ON A TITANIUM OXIDE
4042615 - HYDROCARBON SYNTHESIS FROM CO AND H/2 \ USING NI SUPPORTED ON A TITANIUM OXIDE
4093643 - CATALYTIC FORMATION OF HYDROCARBONS FROM CO, H/2 \ MIXTURES AND PROCESS FOR MAINTAINING CATALYTIC ACTIVITY
4116994 - HYDROCARBON SYNTHESIS FROM CO AND H/2 \ USING RH SUPPORTED ON TITANIUM OXIDES

FLUOR CORPORATION
3795485 - SYNTHESIS GAS GENERATION APPARATUS

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

FORD MOTOR COMPANY

4002658 - METHANATION CATALYST AND PROCESS OF USING THE SAME

FOSTER WHEELER CORPORATION

3619355 - METHOD OF COLLECTING AND TREATING EXHAUST GASES CONTAINING CARBON MONOXIDE

GAS COUNCIL

3511624 - PROCESS FOR PREPARING METHANE-CONTAINING GASES
 3625665 - PROCESS FOR THE PRODUCTION OF METHANE CONTAINING GASES
 3642460 - PROCESS FOR THE PRODUCTION OF A METHANE-CONTAINING GAS
 4032556 - METHANATION OF GASES

GENERAL ELECTRIC COMPANY

3958625 - TRANSPORT OF HEAT AS CHEMICAL ENERGY

GULF RESEARCH + DEVELOPMENT COMPANY

3947483 - METAL CHRYSOTILE METHANE SYNTHESIS CATALYST
 4022810 - METAL CHRYSOTILE METHANE SYNTHESIS CATALYST
 4088671 - CONVERSION OF SYNTHESIS GAS USING A COBALT-RUTHENIUM CATALYST
 4116995 - HYDROCARBON SYNTHESIS USING A RARE EARTH PROMOTED METAL SILICATE

HALDOR TOPSØE A/S

3988262 - METHANATION CATALYST AND PROCESS FOR PREPARING THE CATALYST
 4130575 - PROCESS FOR PREPARING METHANE RICH GASES

HARSHAW CHEMICALS LIMITED

3962140 - NICKEL-COPPER-MOLYBDENUM METHANATION CATALYST

IMPERIAL CHEMICAL INDUSTRIES LIMITED

3458289 - CATALYTIC CONVERTER
 3694169 - LOW PRESSURE-DROP CATALYTIC REACTOR
 3850850 - METHOD OF MAKING A METHANOL SYNTHESIS CATALYST
 3923694 - METHANOL SYNTHESIS CATALYST
 3940428 - METHANOL PRODUCTION
 3950369 - METHANOL PRODUCTION
 3957449 - SYNTHESIS PLANT
 3975169 - PROCESS FOR PRODUCING A NATURAL GAS SUBSTITUTE
 4028067 - PROCESS FOR PRODUCING COMBUSTIBLE GASES
 4065483 - METHANOL

INSTITUTE OF GAS TECHNOLOGY

3787468 - METHANATION OF CARBON MONOXIDE AND CARBON DIOXIDE
 3884838 - RUTHENIUM-REDUCED AMORPHOUS TUNGSTEN OXIDE CATALYST

INSTITUT FRANCAIS DU PETROLE DES CARBURANTS ET LUBRIFIANTS A

4122110 - PROCESS FOR MANUFACTURING ALCOHOLS, PARTICULARLY LINEAR SATURATED PRIMARY ALCOHOLS, FROM SYNTHESIS GAS
 4125566 - PROCESS FOR UPGRADING EFFLUENTS FROM SYNTHESIS OF THE FISCHER-TROPSCH TYPE

JAPAN GAS-CHEMICAL COMPANY INC.

3646131 - PROCESS FOR THE CARBOXYLATION OF COMPOUNDS HAVING A REPLACEABLE HYDROGEN ATOM

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

PAGE C 4

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

JAPAN GASOLINE CO., LTD

- 3870738 - PROCESS FOR MANUFACTURING GASES RICH IN METHANE
- 3917467 - PROCESS FOR MANUFACTURING HIGH PURITY METHANE GAS

JOHNSON MATTHEY + CO., LIMITED

- 4012450 - CATALYTIC REACTIONS

KELLER CORPORATION

- 3968999 - METHOD OF MAKING AVAILABLE FUELS FROM ARCTIC ENVIRONMENTS

KRUPP KOPPERS GMBH

- 3954424 - PROCESS FOR PRODUCING A METHANE-CONTAINING GAS AND ARRANGEMENT THEREFOR
- 3958956 - METHANE PRODUCTION PROCESS AND ARRANGEMENT THEREFOR
- 3973923 - PROCESSES FOR THE PRODUCTION OF METHANE-CONTAINING GASES

LINDE AKTIENGESELLSCHAFT

- 4091008 - PRODUCTION OF A GAS RICH IN METHANE

MANNESMANN ROHRENWERKE AG

- 4027688 - TRANSPORTATION OF FOSSIL FUEL MATERIALS

MERCK PATENT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG

- 4026953 - SOLVENTS FOR NMR SPECTROSCOPY

METALLGESELLSCHAFT AKTIENGESELLSCHAFT

- 3954895 - PROCESS FOR PRODUCING A METHANE-RICH GAS USABLE IN PLACE OF NATURAL GAS
- 3897471 - PROCESS FOR PRODUCING METHANOL
- 3898057 - PROCESS FOR CONVERTING METHANOL TO A HIGH-METHANE GAS
- 3959972 - POWER PLANT PROCESS
- 3962300 - PROCESS FOR PRODUCING METHANOL
- 4012404 - PROCESS FOR PRODUCING HIGH-METHANE GAS
- 4016189 - PROCESS FOR PRODUCING A GAS WHICH CAN BE SUBSTITUTED FOR NATURAL GAS
- 4045960 - PROCESS FOR PRODUCING ENERGY
- 4061475 - PROCESS FOR PRODUCING A GAS WHICH CAN BE SUBSTITUTED FOR NATURAL GAS
- 4087449 - PROCESS FOR PRODUCING METHANOL

MIDLAND-ROSS CORPORATION

- 3970485 - APPARATUS AND METHOD FOR METHANATION

MITSUBISHI GAS-CHEMICAL COMPANY, INC.

- 3840478 - CATALYST OF COPPER OXIDE ZINC-OXIDE-CHROMIUM OXIDE FOR METRANOL SYNTHESIS
- 3939191 - PROCESS FOR METHANOL SYNTHESIS
- 3971735 - METHANOL PRODUCTION CATALYST AND PROCESS FOR PREPARING THE SAME

MOBILE OIL CORPORATION

- 4080397 - METHOD FOR UPGRADING SYNTHETIC OILS BOILING ABOVE GASOLINE BOILING MATERIAL

MOBIL OIL CORPORATION

- 3894102 - CONVERSION OF SYNTHESIS GAS TO GASOLINE
- 3972958 - CONVERSION OF COAL TO HIGH OCTANE GASOLINE
- 3980583 - COMPLEXED METALS BONDED TO INORGANIC OXIDES
- 3983085 - SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION METHOD OF PRODUCING SAME

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING (CONTINUED)

- MOBIL OIL CORPORATION
- 3998898 - MANUFACTURE OF GASOLINE
- 4003825 - SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION, METHOD OF PRODUCING SAME AND PROCESS OF USING SAME
- 4011275 - CONVERSION OF MODIFIED SYNTHESIS GAS TO OXYGENATED ORGANIC CHEMICALS
- 4038600 - CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS
- 4041094 - METHOD FOR UPGRADING PRODUCTS OF FISCHER-TROPSCH SYNTHESIS
- 4041095 - METHOD FOR UPGRADING C/3 \ PLUS PRODUCT OF FISCHER-TROPSCH SYNTHESIS
- 4041096 - METHOD FOR UPGRADING C/5 \ PLUS PRODUCT OF FISCHER-TROPSCH SYNTHESIS
- 4041097 - METHOD FOR ALTERING THE PRODUCT DISTRIBUTION OF FISCHER-TROPSCH SYNTHESIS PRODUCT
- 4044063 - METHOD FOR ALTERING THE PRODUCT DISTRIBUTION OF WATER WASHED, FISCHER-TROPSCH SYNTHESIS HYDROCARBON PRODUCT TO IMPROVE GASOLINE OCTANE AND DIESEL FUEL YIELD
- 4044064 - CONVERSION OF FISCHER-TROPSCH HEAVY PRODUCT TO HIGH QUALITY JET FUEL
- 4046829 - METHOD FOR IMPROVING THE FISCHER-TROPSCH SYNTHESIS PRODUCT DISTRIBUTION
- 4046830 - METHOD FOR UPGRADING FISCHER-TROPSCH SYNTHESIS PRODUCTS
- 4046831 - METHOD FOR UPGRADING PRODUCTS OF FISCHER-TROPSCH SYNTHESIS
- 4048250 - CONVERSION OF NATURAL GAS TO GASOLINE AND LPG
- 4049734 - CONVERSION OF COAL TO HIGH OCTANE GASOLINE
- 4049741 - METHOD FOR UPGRADING FISCHER-TROPSCH SYNTHESIS PRODUCTS
- 4052477 - METHOD FOR UPGRADING A FISCHER-TROPSCH LIGHT OIL
- 4053532 - METHOD FOR IMPROVING THE FISCHER-TROPSCH SYNTHESIS PRODUCT DISTRIBUTION
- 4059648 - METHOD FOR UPGRADING SYNTHETIC OILS BOILING ABOVE GASOLINE BOILING MATERIAL
- 4071574 - CONVERSION OF FISCHER-TROPSCH HEAVY PRODUCT TO HIGH QUALITY JET FUEL
- 4076761 - PROCESS FOR THE MANUFACTURE OF GASOLINE
- 4086261 - METHANATION OVER SYNTHETIC AMORPHOUS SILICAS
- 4086262 - CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES
- 4093029 - UTILIZATION OF LOW BTU NATURAL GAS
- 4096163 - CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES
- 4098339 - UTILIZATION OF LOW BTU NATURAL GAS
- 4098727 - INSOLUBLE POLYMERS HAVING FUNCTIONAL GROUPS CONTAINING CHEMICALLY BONDED GROUP VIII METAL
- MONSANTO COMPANY
- 3433841 - PURIFICATION PROCESS
- 3466340 - ALCOHOL PURIFICATION PROCESS
- 3526670 - PROCESS FOR INCREASING PERMANGANATE TIME OF METHANOL
- 3624165 - PURIFICATION PROCESS
- MONTECATINI EDISON S.P.A.
- 3753662 - SYNTHESIS REACTOR WITH PARTICULAR COOLING MEANS FOR EXOTHERMIC REACTIONS AT HIGH PRESSURE
- PARSONS, RALPH M., COMPANY
- 3938968 - PROCESS FOR THE PRODUCTION OF SUBSTITUTE NATURAL GAS
- PHILLIPS PETROLEUM COMPANY
- 3600145 - PRODUCTION OF METHANE FROM CARBON MONOXIDE AND STEAM
- 3642915 - PURIFICATION OF ALCOHOLS
- 3988334 - METHOD FOR METHANATION
- 4011058 - PRODUCTION OF SUBSTITUTE NATURAL GAS FROM GASIFICATION OF COAL CHAR
- 4071331 - PROCESS FOR PRODUCING METHANE FROM CARBON MONOXIDE AND STEAM
- 4079072 - METHANATION PROCESS
- PRITCHARD, J. F., AND COMPANY
- 3501516 - METHOD FOR PRODUCTION OF METHANOL

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

PULLMAN, INCORPORATED

- 3484197 - PROCESS FOR CARRYING OUT CYCLIC SYNTHESIS REACTIONS AT ELEVATED PRESSURES
- 3567404 - REACTOR VESSEL
- 3598527 - AMMONIA AND METHANOL PRODUCTION

RALPH M. PARSONS COMPANY

- 3999961 - SULFUR CONTROL OVER CARBON FORMATION IN HIGH TEMPERATURE REFORMING OPERATIONS
- 4050908 - PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM COAL
- 4115075 - PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM CARBONACEOUS MATERIALS

RHEINISCHE BRAUNKOHLENWERKE AG

- 4109701 - METHOD OF CONVEYING HEAT ENERGY

RIO TINTO (RHODESIA) LIMITED

- 4076612 - PROCESS FOR OBTAINING LIQUID FUEL-OIL AND/OR GASEOUS HYDROCARBONS FROM SOLID CARBONACEOUS FEED STOCKS

RUHRGAS AKTIENGESELLSCHAFT

- 4082520 - PROCESS OF PRODUCING GASES HAVING A HIGH CALORIFIC VALUE

SAGAMI CHEMICAL RESEARCH CENTER

- 3842113 - CATALYST FOR REDUCING CARBON DIOXIDE
- 3842121 - CATALYST FOR REDUCTION OF CARBON MONOXIDE

SHELL OIL COMPANY

- 3709919 - PRODUCTION OF METHANOL
- 3758417 - COPPER, ZINC, DIDYMIUM OXIDE-CONTAINING CATALYSTS
- 3917468 - SYNTHETIC NATURAL GAS PRODUCTION
- 3979332 - HIGH TEMPERATURE METHANATION WITH MOLTEN SALT-BASED CATALYST SYSTEMS
- 3996256 - METHANATION CATALYST
- 4006177 - METHANATION CATALYST RECOVERY
- 4045461 - HIGH TEMPERATURE METHANATION WITH MOLTEN SALT-BASED CATALYST SYSTEMS

SKF INDUSTRIAL TRADING AND DEVELOPMENT COMPANY B.V.

- 3852180 - APPARATUS FOR CO/2\ CONVERSION TO METHANE

SNAM PROGETTI S.P.A.

- 4098809 - PROCESS FOR THE PRODUCTION OF DIMETHYL ETHER

SOCIETE FRANCAISE DES PRODUITS POUR CATALYSE

- 4126581 - CATALYST CONTAINING COPPER OXIDE AND ZINC OXIDE, ITS MANUFACTURE AND ITS USE FOR THE CONVERSION OF CARBON MONOXIDE

TEXACO DEVELOPMENT CORPORATION

- 3920717 - PRODUCTION OF METHANOL
- 3922148 - PRODUCTION OF METHANE-RICH GAS
- 3980590 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS
- 3980591 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS
- 3980592 - RECOVERY OF PARTICULATE CARBON FROM SYNTHESIS GAS
- 4081253 - PRODUCTION OF PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE
- 4110359 - PRODUCTION OF CLEANED AND PURIFIED SYNTHESIS GAS AND CARBON MONOXIDE

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING

TEXACO INC.
 3709669 - METHANE PRODUCTION
 3759679 - PRODUCTION OF METHANE-RICH FUEL GAS
 3890113 - PRODUCTION OF METHANE
 3927997 - METHANE-RICH GAS PROCESS
 3927998 - PRODUCTION OF METHANE-RICH GAS STREAM
 3927999 - METHANE-RICH GAS PROCESS
 3928000 - PRODUCTION OF A CLEAN METHANE-RICH FUEL GAS FROM HIGH-SULFUR CONTAINING HYDROCARBONACEOUS MATERIALS
 3928001 - PRODUCTION OF METHANE
 4030981 - PROCESS FOR MAKING OIL FROM AQUEOUS REACTIVE SLUDGES AND SLURRIES

TOYO-KOGYO CO., LTD.

3615200 - PROCESS FOR CONCENTRATING INERT COMPONENTS IN PRESSURIZED SYNTHESIS LOOP

UNION CARBIDE CORPORATION

3833634 - MANUFACTURE OF POLYFUNCTIONAL COMPOUNDS
 3940432 - PROCESS FOR MAKING ETHYLENE GLYCOL
 3944588 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 3948965 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 3952039 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 3957857 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 3968136 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 4001289 - ALCOHOL-RHODIUM SEPARATION PROCESS
 4013700 - CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES
 4014913 - PROCESS FOR PRODUCING OXYGENATED TWO CARBON COMPOUNDS
 4064156 - METHANATION OF OVERSHIFTED FEED
 4096164 - PROCESS FOR PRODUCING ETHANOL, ACETIC ACID AND/OR ACETALDEHYDE, FROM SYNTHESIS GAS
 4111975 - CATALYTIC PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES
 4115428 - CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES
 4115433 - CATALYST AND PROCESS FOR PRODUCING POLYHYDRIC ALCOHOLS AND DERIVATIVES
 4119656 - PREPARATION OF HYDROXYLATED COMPOUNDS FROM SYNTHESIS OF GAS WITH PALLADIUM CATALYSTS
 4124628 - SERIAL ADIABATIC METHANATION AND STEAM REFORMING
 4129553 - PROCESS FOR MAKING OXYGENATED CARBON COMPOUNDS

UNION OIL COMPANY OF CALIFORNIA

3856702 - ALUMINUM BORATE CATALYST COMPOSITIONS
 3856705 - ALUMINUM BORATE CATALYST COMPOSITIONS
 3988253 - THERMALLY STABLE COPRECIPITATED CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS
 4024171 - ALUMINUM BORATE CATALYST COMPOSITIONS AND USE THEREOF IN CHEMICAL CONVERSIONS
 4042532 - THERMALLY STABLE NICKEL-ALUMINA CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS AND METHOD FOR THE MANUFACTURE OF SAID CATALYSTS
 4064152 - THERMALLY STABLE NICKEL-ALUMINA CATALYSTS USEFUL FOR METHANATION
 4065484 - METHANATION PROCESS WITH INTERMITTENT REACTIVATION OF CATALYST
 4124629 - THERMALLY STABLE COPRECIPITATED CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS

UNION RHEINISCHE BRAUNKOHLEN KRAFFTSTOFF AKTIENGESELLSCHAFT

3690550 - PROCESS FOR TRANSPORTING THERMAL ENERGY

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

3619365 - NUCLEAR REACTORS AND COOLANT THEREFOR

ASSIGNED PATENTING(1/69 - 12/78) - - ALPHA LISTING
 UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY
 3957460 - OXIDATION OF COAL-WATER SLURRY FEED TO HYDROGASIFIER
 3967936 - METHANATION PROCESS UTILIZING SPLIT COLD GAS RECYCLE
 3971634 - HEAT PIPE METHANATOR

UNITED STATES OF AMERICA, DEPARTMENT OF STATE
 3989734 - SLURRY PHASE METHANATION PROCESS

UNITED STATES OF AMERICA, INTERIOR
 3429679 - PROCESS FOR IMPROVING THE HEATING VALUES OF FUEL GASES
 3840354 - THREE-STAGE GASIFICATION OF COAL
 3844733 - TWO-STAGE DOWNFLOW GASIFICATION OF COAL
 3904386 - COMBINED SHIFT AND METHANATION REACTION PROCESS FOR THE GASIFICATION OF CARBONACEOUS MATERIALS

UNITED STATES OF AMERICA, NAVY
 4089812 - MASSIVE CATALYST

UNIVERSITY OF WYOMING
 3505204 - DIRECT CONVERSION OF CARBONACEOUS MATERIAL TO HYDROCARBONS

UDP INC.
 4010008 - SUBSTITUTED NATURAL GAS VIA HYDROCARBON STEAM REFORMING
 4013737 - UPGRADING SYNTHETIC GASOLINE

VENTRON CORPORATION
 3847963 - METHANATION PROCESSES

VULCAN-CINCINNATI, INC.
 3480407 - MULTIPLE ZONE APPARATUS FOR THE PROCESSING OF FLUIDS HAVING INTERZONE FLUID MIXING AND REDISTRIBUTION FEATURES

W. R. GRACE + CO.
 3933883 - METHANATION CATALYST AND PROCESS OF USE

SYNTHETIC FUELS II C 2- IN VITRO - REACTING SYNTHESIS GAS UNASSIGNED PATENTS (1/75-12/78) INVENTORS (ALPHA LISTING)

INVENTOR NAME	STREET	CITY	ST	ZIP/CNTRY
DAVID L.	39 RUE ST.-PLACIDE	75006 PARIS		
3904389 - BANQUY	PROCESS FOR THE PRODUCTION OF HIGH BTU METHANE-CONTAINING GAS	LOUISVILLE	KY	40272
JACKIE LOU	110 OLDE ENGLISH CT.			
3876557 - BLAND	METALLIC CATALYST			
WARREN	107 CHERRY LANE, LAUREL HOLLOW	SYOSSET, L. I.	NY	11791
3941869 - FUCHS	PROCESS FOR EXOTHERMIC REACTIONS			
ROBERT KENNETH	CARLTON HOUSE, SUITE 1431, 550	PITTSBURGH	PA	15219
4013454 - JORDAN	COPRODUCTION OF IRON WITH METHANOL AND AMMONIA			

PATENTS (1/63-12/78) WITH NEITHER ASSIGNMENT NOR INVENTOR INFORMATION IN DATABASE

3625664 -	PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS			
3751228 -	APPARATUS FOR REFORMING HYDROCARBONS UNDER PRESSURE			
4107089 -	CATALYST FOR THE SYNTHESIS OF METHANOL AND METHOD FOR PREPARING SAME	3243421	3251648	3254967
3071453	3122493	3131212	3156657	3186145
3256208	3271326	3318955	3326956	3347647
3379505	3384458	3387942	3350170	3361535
			3351564	3372988
			3373180	3376332