

pass for each standard cubic meter of synthesis gas. For the second reaction, 1.880 tons of DME or 2.615 tons of methanol produced 1 ton of light olefins, which constitutes of 0.533 ton of ethylene, 0.349 ton of propylene and 0.118 ton of butene. DICP also paid some attention on direct conversion of synthesis gas to light olefins.

00/01763 New type of slurry as fuel oils' alternative. Petro-coke residue slurry

Wang, Z. and Li, B. *Meitan Zhuanhua*, 1998, 21, (4), 37–40. (In Chinese) The history of using coal slurry fuels is reviewed, with special detail paid to the current problems in the oil-fired boilers. In addition a proposition of a new mixture was made, based on a combination of petro-coke and vacuum residue as a partial alternative for fuel oils in industrial boilers.

00/01764 Oil agglomeration of coal slurries

Blaschke, Z. *Environ. Issues Waste Manage. Energy Miner. Prod., Proc. Int. Symp., 5th*, 1998, 639–642.

Experimental results of enrichment of coal slurries under laboratory conditions are presented in this paper. The investigations demonstrate that it is possible to significantly decrease the amount of oil used in the agglomeration process due to the effect of co-operation of collectors, diesel oil and fatty acid.

00/01765 Oil containing block fuel

Wei, G. Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1,116,232 (Cl. C10L7/00), 7 Feb 1996, Appl. 94,108,806, 30 Jul 1994. 4. (In Chinese) The composition of an oil containing block fuel is coal, binding agent, plant cellulose and 20–80% oil-clay mixture with the weight ratio of 1:1.5–4. The fuel consists of oil-clay mixture (the weight ratio of 1:2) 60, coal gangue powder 20, coal slag 10, plant powder 8, table salt 1, and diluted acid sodium salt 1 wt%.

00/01766 PET coprocessing with Yallourn brown coal under hydrolifuefaction conditions

Bongers, G. D. *Prepr. Symp. – Am. Chem. Soc., Div. Fuel Chem.*, 1999, 44, (2), 306–310.

Polyethylene terephthalate (PET) was used in the coprocessing of Yallourn brown coal, at low loadings it had a minimal impact on the first-stage of hydrolifuefaction. Therefore, it is possible that hydrolifuefaction could be an alternative industrial disposal method for PET. The lower amounts of aromatic acids and higher alkylbenzenes produced upon flash pyrolysis of coprocessed products, compared with flash pyrolysis of coal or polymer separation, is evidence for the formation of coal-polymer compounds at the molecular level. At low liquefaction temperatures (370°), solvent is absorbed into PET. On the other hand, at normal the normal temperature for liquefaction (430°), the polymer melts but does not readily decompose. To completely decompose, PET requires severe reaction conditions.

00/01767 Polyolefin degradation in a continuous coal liquefaction Reactor

Rothenberger, K. S. *Energy Fuels*, 1999, 13, (3), 710–718.

This paper reports on a novel solvent extraction method to isolate and recover polyolefin materials from coal-plastics co-processing product streams. The method was applied to samples obtained from a bench-scale continuous unit, co-processing coal with polyethylene (PE), polypropylene (PP), and polystyrene (PS) feed. Infrared and nuclear magnetic resonance spectroscopies have been used to characterize the recovered PE and PP. The results indicate that PP undergoes a fairly rapid reaction and its conversion is complete before reaching the downstream portion of the process. On the other hand, PE undergoes some degradation in the coal liquefaction reactor, with an average reduction in molecular weight distribution for the 'unconverted' material by a factor of 10 to 30. It has also been established that most of the PE degradation occurs in the first-stage liquefaction reactor. This partially converted, but undistillable material then passes into the atmospheric still bottoms stream. The two solid separation methods examined had very different effects on the incompletely reacted PE. Vacuum distillation sequesters the PE in the unconvertable (ashy) fraction, whereas pressure filtration allows most of it to pass through into the recycle stream.

00/01768 Preparation aromatic of liquid hydrocarbons from synthesis gas

Udrea, I. Rom. RO 107,644 (Cl. C07C1/04), 30 Dec 1993, Appl. 144,844, 18 Apr 1990. 3. (In Romanian)

There are two stages involved in the preparation of aromatic liquid hydrocarbons from synthesis gas. The first step involves the conversion of synthesis gas into a mixture of alcohols using a Fe/Cu/K catalyst at 280°. The second stage is the conversion of alcohols into aromatic hydrocarbons, C6–C10, using the catalyst HZSM-5 (SiO₂/Al₂O₃ ratio 55) at 380°.

00/01769 Preparation of dimethyl ether

Ogawa, T. Jpn. Kokai Tokkyo Koho JP 11 130,714 [99 130,714] (Cl. C07C43/04), 18 May 1999, Appl. 97/292,668, 24 Oct 1997. 6. (In Japanese) The preparation of Me₂ is described. The procedure involves the treatment of gases containing carbon monoxide and hydrogen with oil slurries containing catalysts, cooling the reaction product gases for condensation and separation of the oil media, collecting Me₂O from the separated gases. The condensed oil media is treated with activated carbon or zeolites at 1–50

L/kg/h to remove catalyst-inactivating components and returning the purified oils into the oil slurries. Raw material gas was treated with Cu-Zn-Al₂O₃ catalyst slurried in n-cetane, which was circulated and treated with activated carbon at 24.5 L/kg/h for adsorption and removal of catalyst-inactivating sulfur components, to give Me₂O with carbon monoxide conversion of approximately 40% for 25 hours.

00/01770 Problems and countermeasures in stable operation of coal liquefaction experimental apparatus

Kuriki, Y. *Anzen Kogaku*, 1999, 38, (1), 17–23. (In Japanese)

The problems involved in handling high-pressure hydrogen and coal liquefaction slurries are discussed. It is not necessary to constantly use a compressor owing to a large capacity pressure storage device that is used to supply H₂. Prevention of settling of solid from the slurry and valve erosion are also studied for safe and stable operation of the coal liquefaction process. A 0.1 t/d coal liquefaction apparatus is thus improved for studying the oil and the re-circulating solvent components experimentally.

00/01771 Process for the simultaneous conversion of waste lubricating oil and pyrolysis oil derived from organic waste to produce a synthetic crude oil

Kalnes, T. N. and James, R. B. U. S. US 5,904,838 (Cl. 208-179; C10G45/00), 18 May 1999, Appl. 62,089, 17 Apr 1998. 7.

Presented is a process for the simultaneous conversion of waste lubricating oil and pyrolysis oil derived from organic waste to produce a synthetic crude oil. The combined feed is contacted with a hot hydrogen-rich gaseous stream to increase the temperature of the combined feed to vaporize at least a portion of the distillable organic compounds contained therein, which is immediately hydrogenated in a hydrogenation reaction zone. In order to produce higher hydrogen-content hydrocarbons and to remove heterogeneous components such as sulfur, nitrogen and oxygen, the resultant effluent from the hydrogenation reaction zone is introduced into a hydroprocessing zone. The resulting effluent is cooled and partially condensed to produce a gaseous stream containing hydrogen and gaseous water-soluble inorganic compounds and a liquid stream containing hydrocarbon compounds. It is possible to produce a hydrogen-rich gaseous recycle stream if the gaseous stream is scrubbed to remove the gaseous water-soluble organic compounds.

00/01772 Study for development of the coal liquefaction process by 150 t/day coal liquefaction pilot plant. III. Properties of coal liquefaction products and their toxicological assessment

Aramaki, T. *Nippon Enerugi Gakkaishi*, 1999, 78, (2), 110–119. (In Japanese)

Reported in this paper is the research, which relates to characteristic properties of coal liquefaction products and their toxicology properties. The results of mutagenicity tests (Ames tests and chromosome aberration tests) and the analysis of chemical components of light oil, middle oil, heavy oil, and liquefaction residues are provided. In the light oil, a high cresol content (≥5 wt%) was detected.

00/01773 Study on the ultrasonic irradiation of coal water slurry

Li, Y.-X. and Li, B.-Q. *Fuel*, 2000, 79, (3–4), 235–241

The effects of ultrasonic irradiation on the properties of coal water slurry (CWS), such as apparent viscosity, rheological behaviour and static stability, were investigated. The ultrasonic intensity was varied from 40 to 80 W cm⁻² and irradiation time from 2 to 10 mm. Ultrasonic irradiation distinctly improves both rheological behavior and static stability of CWS with a slight increase in the apparent viscosity of CWS containing 1% additive. The mechanisms having a remarkable improvement on the properties of CWS were proposed by measuring the changes of coal particle size distribution and dissolved ions in CWS before and after ultrasonic irradiation. The ultrasonic irradiation may provide a new technology for CWS preparation.

00/01774 The direct liquefaction co-processing of coal, oil, plastics, MSW, and biomass

Comolli, A. G. *Prepr. Symp. – Am. Chem. Soc., Div. Fuel Chem.*, 1999, 44, (2), 300–305.

Waste plastics/coal co-processing technology have been developed by HTI to produce fuels that can be produced at a cost comparable to crude oil. Further development would recycle plastics and organic wastes, turn them into valuable feedstocks, remove sulfur and nitrogen and lower CO₂ emissions, while utilizing domestic feedstocks. This paper also presents conversion and yield data will for various feedstock combinations and concepts for further studies. Forecasts will be made on the economics of coal and waste co-processing, based on stand-alone and refinery-integrated facilities.

00/01775 The effect of pyrite catalyst on the hydrolifuefaction of Goynuk (Turkey) oil shale in the presence of toluene

Metecan, I. H. *Fuel*, 1999, 78, (5), 619–622.

In the presence of supercritical toluene, the hydrolifuefaction of Goynuk oil shale in the presence and absence of a catalyst was carried out. In both cases, the maximum conversion and the yield of extraction was reached at 400°C. A discussion is also included on the effect of a pyrite catalyst on the process.