从能源多元化角度看甲醇燃料

Methanol Fuel in Perspective of Energy Diversified Development

—甲醇燃料应用在动力燃烧领域Methanol Fuel Applications in Combustion for Motive Power

—甲醇燃料的热力燃烧

Methanol Fuel Applications in Combustion for Thermal Power

—甲醇燃料输配送体系建设

Distribution System Construction of Methanol Fuel

科学认识甲醇燃料-1

Scientific Understanding of Methanol Fuel-1

Methanol, compared to gasoline and diesel liquid fuels, has the same characteristic of high combustion efficiency – a methanol molecule contains an oxygen atom in the middle; oxygen and carbon/hydrogen each take up half of the mass.

科学认识甲醇燃料-2

Scientific Understanding of Methanol Fuel-2

The Chinese coal-based methanol fuel comes from the coal chemical industry & has many production sites, therefore convenient. Because the production technologies are mature, it is easy to increase capacity and output to meet future demands.

科学认识甲醇燃料-3

Scientific Understanding of Methanol Fuel-3

Methanol is soluble in water，thus quickly diluted when it enters water or soil，or can be degraded by microorganisms. The speed and ability of methanol to self-degrade is greater than those of gasoline/diesel，thus is environmentally friendly.

科学认识甲醇燃料-4

Scientific Understanding of Methanol Fuel-4

Adding a methanol fuel function on the original liquid fuel system requires little input or change，and has the same basic convenience and consistency as the original system.

中国汽车报网专家讲堂

Expert Articles in China Auto News

—《甲醇是目前人类认识和认知的最为安全、高效、清洁的替代燃料》*Methanol is the Safest, Cleanest, and Most Efficient Alternative Fuel Known Yet*

—《甲醇燃料的全球视角》*The Global Perspective of Methanol*

甲醇燃料
应用在动力燃烧领域

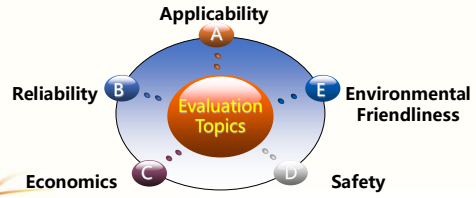
Methanol Fuel Applications in Combustion for Motive Power

工信部、发改委、科技部组织的甲醇汽车试点

Methanol Vehicle Pilot Organized by MIIT, DNRC and MOST

试点验证和为后续推广运行确定的评价重点

Key Points in Valuating of the Pilot and future Promotion



Modify existing Methanol-fueled and some gasoline/diesel vehicles on the market, conduct diagnostic experiments, collect data concerning technology, compose "Methanol-fueled vehicles Technological Requirements", publish《Notice concerning the development of Methanol-fueled Vehicles Pilot Projects》Ministry of Industry【2012】File No. 42.

On March 13th ,2013, 100 methanol-fueled taxis were put into service in JinZhong City, ShanXi, thus starting ShanXi, ShangHai, ShaanXi, GanSu, GuiZhou (5 provinces and 10 cities) in selecting methanol-fueled vehicles from different manufacturers and different models as the starting point of the methanol pilot project.

The Methanol-fueled Vehicles pilot project, jointly organized by MIIT, Development and Reform Committee, and the Ministry of Science, will be implemented according to schedule, with data collected from all 10 cities at the beginning of 2018. Total input of 1024 experimental vehicles, running for a total of 184 million kilometers.

On the basis that the original experimental vehicles are still in service, there are currently over 10,000 methanol-fueled taxis operating for a total of 1.2 billion kilometers between different models. The surveyed rate of malfunction is still less than the statistics summarized from the experiment.

甲醇汽车试点成效

Methanol Vehicle Pilot Results

The Methanol-fueled Vehicles Experiment has lasted 10 years. The experiment has answered questions, resolved concerns, and established consensus. It has also inspired the use of Methanol in ships, furnaces, mobile and stationary power stations, cooking stoves, and other similar areas.

甲醇汽车产业现状

Methanol Automobile Industry Status

Published announcements for 9 Methanol-fueled Vehicles manufacturers and 32 product models, basically formed a variety of models, including cars, minicars, city buses, methanol/diesel heavy commercial vehicles, etc.

甲醇汽车试点成果

Methanol Vehicle Pilot Results

Analyze data collected from the experiment; organize and report Experimental Summary Report.

Complete the investigation on effects on human health from using Methanol as fuel; study on normal and abnormal emission; analysis on the life cycle of Methanol as vehicular fuel.

Speeding Up the Methanol-Fueled Vehicles Production System

Improve upon the current basis to perfect the production system and increase the standard for Methanol technology. Develop Methanol-fueled passenger vehicles, commercial vehicles, off-road vehicles and other engines. Perfect factory construction and design.

Strengthen Production of Specialized Parts

Construction of large scale manufacturing system around methanol fuel supply injection system, special post-treatment device, special filter, special lubricating oil, alcohol-resistant materials and key components in order to improve research and manufacturing level.

Breaking Through Key Technologies of Methanol Vehicles

Encourage and support enterprises to develop methanol hybrid vehicles, methanol additive electric vehicles, and methanol fuel cell vehicle products. Accelerate the transformation of scientific research results and industrial application of methanol vehicles.

Establish a Standard System for Methanol Vehicles

Organize the production of methanol vehicles, methanol engines, special lubricating oils, methanol reference fuel, pollutant discharge according to the durability manageability, practicality, and according to the characteristics and application needs of methanol vehicles.

Strict Management of Methanol Vehicles Compliance

For methanol vehicles that meet the standards, the registration of motor vehicles, fuel types are endorsed as methanol, and ordinary motor vehicle number plates are issued. Methanol vehicles will be included in the management of "Parallel Management Measures for the Average Fuel Consumption of Passenger Vehicle Enterprises and New Energy Vehicle Points."

Actively Engage in International Collaboration and Cooperation

Utilize the role of industrial organizations to promote popularization of Methanol Fuel and automotive knowledge. Encourage research institutes and related enterprises engage in international collaborations. Support Methanol-fueled vehicles manufacturing industries in accelerating the globalizing process, promote Methanol vehicles in the global market.

甲醇燃料
应用在道路运输装备

Methanol Fuel in Applications of Road Transportation Equipment

综合热效率更高的内燃机

ICE of Higher Total Efficiency

Use in on-the-road, off-road (agricultural, construction, railway, ships, fixed equipments), and national defense. Fueled by gasoline, diesel, heavy oil, methanol, ethanol, and other liquid fuels, and gaseous fuels such as natural gas and biogas.

混合动力系统
Hybrid Power System

Passenger cars and small vehicles mainly used on-road can achieve internal combustion power and electric power respectively or co-drive, equipped with energy reserves of power batteries, with a high energy recovery efficiency.

增程式驱动动力系统
Range Extended Power System

Vehicles mainly used on-road such as passenger cars have a battery with stored power，with mechanical energy from driving for the motor, equipped with an internal combustion engines as initial power generation, in order to guarantee operation when driving power for the motor is insufficient.

甲醇燃料电池动力系统
Methanol Fuel Cell Power System

In the engineering application stage, the main application targets are small and medium-sized freight vehicles and passenger vehicles, which can effectively reduce the capital pressure for hydrogen energy preparation and filling station construction.

MIIT 12-29-2017 Vehicles Announcement No. 303

Name of Company：Dongfeng Motor Co

Brand：Dongfeng

Product Name：1. Methanol reforming hydrogen fuel cell loading vehicle chassis 2. Methanol reforming hydrogen fuel cell compartment transporter

Product Number：EQ1080、EQ5080X

甲醇燃料
应用在水面运输及
作业装备

Methanol Fuel in Application of Waterborne Transportation and Equipment

珠三角、长三角、环渤海（京津冀）水域船舶排放控制区实施方案。

China ECAs by MOT

In 2015, the Ministry of Transport implemented “People’s Republic of China Air Pollution prevention and control Law” in order to promote the development of green shipping and ship emission reduction, and reduce atmospheric pollutant emissions in key areas.

On November 4, 2017, the China Classification Society officially released the “Application of Alternative Fuels for Ships Guide”, effective December 1, 2017. The release of the guide signifies that China’s shipbuilding industry has formally taken steps towards emission control and innovation development in the field of fuel diversification.

The International Maritime Organization (IMO) will implement sulfur emission control worldwide in 2020 to promote alternative fuel applications, including methanol. The “Low Flash Point Fuel Rule", which includes methanol fuel in its text, was adopted as an international regulation at the CCC5 conference in London, England, in September 2018.


中华人民共和国生态环境部
Ministry of Ecology and Environment of the People's Republic of China

索 引 号：000014672/2016-00786　　分类：环境科技及其管理信息\环境标准
发布机关：环境保护部　　生成日期：2016年05月26日
名　　称：关于发布《船舶发动机排气污染物排放限值及测量方法（中国第一、二阶段）》等五项国家污染物排放标准的公告
文　　号：公告 2016年 第56号　　主 题 词：

环境保护部公告

公告 2016年 第56号

关于发布《船舶发动机排气污染物排放限值及测量方法（中国第一、二阶段）》等五项国家污染物排放标准的公告

为贯彻《中华人民共和国环境保护法》、《中华人民共和国水污染防治法》和《中华人民共和国大气污染防治法》，防治污染，保护和改善生态环境，保障人体健康，现批准《船舶发动机排气污染物排放限值及测量方法（中国第一、二阶段）》等五项标准为国家污染物排放标准，并由我部与国家质量监督检验检疫总局联合发布。

标准名称、编号如下：

一、船舶发动机排气污染物排放限值及测量方法（中国第一、二阶段）（GB15097—2016）；

中华人民共和国生态环境部
Ministry of Ecology and Environment of the People's Republic of China

索 引 号：000014672/2018-00125　　分类：环境科技及环境管理信息\其他环境科技信息
发布机关：环境保护部　　生成日期：2018年01月25日
名　　称：关于发布国家环境保护标准《船舶水污染物排放控制标准》的公告
文　　号：公告 2018年 第12号　　主 题 词：

环境保护部公告

公告 2018年 第12号

关于发布国家环境保护标准《船舶水污染物排放控制标准》的公告

为贯彻《中华人民共和国环境保护法》《中华人民共和国水污染防治法》《中华人民共和国海洋环境保护法》，防治污染，保护和改善生态环境，保障人体健康，现批准《船舶水污染物排放控制标准》为国家污染物排放控制标准，并由我部与国家质量监督检验检疫总局联合发布。

甲醇在船舶柴油机的应用
Methanol in Marine Diesel Engine Applications

Report

In 2017, with the support of the former Ministry of Agriculture and Fisheries Inspection Bureau, the diesel/methanol two combustion research team of Tianjin University completed a bench test for diesel engine switching to methanol fuel at Zi Chai, and is preparing to install a fishing vessel for further testing.

2018 Tianjin University Diesel/Methanol two-yuan combustion research team, in cooperation with Yuchai, is about to begin the transformation of methanol fuel for multi-purpose small marine diesel engines at Jiang Long Boat Company.

FOCUS

Report

甲醇燃料
应用在铁路机车装备
Methanol Fuel in Applications of Locomotive Equipment

FOCUS

甲醇在机车发动机上应用 Methanol Fuel in Locomotive Engine

Report

2013 Tianjin University Diesel/methanol two yuan fuel combustion research team carried out the methanol transformation of Chinese vehicle EQ6240ZJ engine and completed the related bench test. 2018 began to cooperate with China Automobile Qishuyan Group, is about to begin the methanol transformation of R6280ZC diesel engine.

FOCUS

甲醇燃料
应用在非道路移动机械装备领域

Methanol Fuel in Applications of Off Road Motive Equipment

非道路工程机械的甲醇化改造 Methanol Retrofitting in Off Road Engineering Machine

Methanol transformation of 44 mining vehicles in Guizhou um and phosphorus mine after 2 years of operation tests

The minecart of Zhongmao Minecart in Xinjiang has been reformed successfully to realize the operation of diesel/methanol cooperating fuel.

Tianjin port with loader for methanol transformation, the successful realization of diesel/methanol cooperative fuel operation.

甲醇燃料的热力燃烧

Methanol Fuel Applications in Combustion for Thermal Power

中华人民共和国环境保护部
Ministry of Environmental Protection of the People's Republic of China

环境保护部函

环函[2015]178号

关于醇基燃料锅炉执行标准有关问题的复函

河北省环境保护厅：

你厅《关于醇基燃料锅炉执行标准有关问题的请示》（冀环科〔2015〕178号）收悉。经研究，现函复如下：

醇基燃料是一种以甲醇为主，混合有乙醇、丙醇等多元醇类和类似的低热值液体燃料。充分燃烧后会排放一氧化碳、碳氢化合物、二氧化碳、氮氧化物和颗粒物。

欧盟、德国等国外锅炉排放标准中，均将甲醇、乙醇、沥青、燃料油归类为液体燃料类，执行统一的标准限值，建议醇基燃料的锅炉参照《锅炉大气污染物排放标准》（GB 13271-2014）中燃油锅炉的排放控制要求执行。

特此函复。

环境保护部

2015年12月24日

抄送：其他各省、自治区、直辖市环境保护厅（局）。

分享到：

Methanol fuel thermal combustion is very safe, does not spontaneously combust, does not explode easily. Environmentally friendly: gaseous sulfur dioxide emissions <15mg/m3, nitrogen oxide emissions <30mg /m3. Economically sound: easy to modify the original thermal equipments, requires short time and little investment; Boiler saturated steam ton fuel consumption is about 120kg / T.

With the general enhancement of the consci ousness of environmental protection in society, thermal combustion will conform to the requirements of green development and emission standards, and develop towards refinement and automation. The thermal combustion of methanol fuel is bound to become a new economic growth point in the green energy era.

附：部分工程实施案例 Some Engineering Case Studies

- 1. Popularization model project of alcohol liquid fuel for industrial furnace in Guizhou province

Proposal site

Media Interviews

Client visits

贵州新闻报道

附：部分工程实施案例 Some Engineering Case Studies

- 2、 Pharmaceutical industry / steam boilers

Methanol fueled instead of coal fueled thermal combustion

Water vapor heating in the pharmaceutical company's workshop; Increase production capacity： 20%

Flue gas emissions: meeting GB low emission indicators; Reduce Fuel Cost：10%

附：部分工程实施案例Some Engineering Case Studies

- 3、 Steam boilers

Methanol fuel instead of light diesel thermal combustion


Improved operating environment, no diesel smell, lower fuel cost by 20%.

附：部分工程实施案例 Some Engineering Case Studies

- 4、 Building materials industry / steam boiler

Methanol fuel instead of coal fuel thermal combustion



Coating workshop steam-heated boiler; Increase production capacity 16% Pipe and spile steam maintenance
Flue gas emissions: meeting GB low emission indicators; Reduce Fuel Cost 10%

附：部分工程实施案例 Some Engineering Case Studies

- 5、 Low temperature alloy smelting industry / aluminum melting furnace

Methanol fuel instead of heavy oil thermal combustion



The workshop environment has been greatly improved, the service life of the dry pot has been extended by more than 5 times, and 9 large-scale axial flow exhaust fans have been deactivated. The fuel cost is slightly higher, but the comprehensive cost is reduced, and the energy consumption per unit product is reduced.

附：部分工程实施案例 Some Engineering Case Studies

- 6、 Heavy metallurgical industry application demonstration

Methanol fuel instead of coal gas to forge ladle



The fuel cost is slightly higher for solving the contradiction between the steel ladle insulation and the hot rolling, but the temperature requirement of the hot rolling process is guaranteed, the superior product rate of the rolled steel plate is increased by 30%, and the comprehensive benefit is obvious.

附：部分工程实施案例 Some Engineering Case Studies

- 7、 20t/h steam ton boiler coal to alcohol demonstration

4 sets of 20t/h steam boilers in Kailuan Coal Mine

4 sets of 20t/h boiler coal to alcohol, does not need to replace the boiler for safety compliance, installed from the side opening, equipped with two 10t burners in parallel; the boiler body does not move, only the furnace is blocked with additional reinforcements. The combustion device, after the actual operation, has low emission, the thermal efficiency is increased by 20%, and the output of the burner is only 80% at full load operation.

57

甲醇燃料输配送体系建设

Distribution System Construction of Methanol Fuel

Office of the Ministry of Transport
National Development and Reform Commission Office
Notice on the publication of the second batch of demonstration projects for multimodal transport projects
Notice on Delivery [2017] No. 159

The second batch of multimodal transport demonstration projects, item six, is: Liquid chemical (methanol, refined oil) tank container Multimodal demonstration project.

结 束 语 Conclusion

Due to China’s energy structure in lack of oil, gas and coal, the development of clean carbon-based fuel conversion and utilization, and promotion of methanol fuel and application are one of the favored technologies to achieve power combustion and thermal combustion and effectively reduce pollutant emissions.

谢谢各位！Thanks

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