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# Based on the Current Mining Methods of Combustible Ice and Detection of Combustible Ice Research on the Seabed Environment

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***Abstract:*** *Natural gas hydrates are also referred to as flammable, which refers to a crystallization formed by combining with a variety of natural gas and groundwater in a variety of temperature high pressure, low temperatures, etc. Chemical material. Because of its overall appearance, it is a bit like flammable ice, and it will be burned. Therefore, they are widely referred to by modern people as "flammable ice", "solid gas" and "free ice". This natural gas hydrothermal is mainly widely distributed in the world of deep sea or near land. After the gas burns, it can only release a small amount of gas carbon dioxide and natural water, and the pollution has far exceeds natural coal, petroleum, etc., and its energy reserves. Huge. Therefore, it is widely recognized by the current world because it is still the main energy source of oil and the like.*

***Keywords:*** *Mining methods, Combustible ice, seabed environment*

## 1. Mining methods of Combustible ice

### *1.1 Traditional mining method*

(1) Hot air excitation methane mining process method: hot air excitation methane mining process method is actually directly heating a methane solution dissolved in a natural gas hydrate homogeneous solution, making The methane temperature dissolved in the natural gas hydrate homogeneous solution is much more than the temperature of its homogeneous layer, thereby directly pushing a traditional mining process of decomposition from the natural gas hydrate layer to become natural water and other natural gas.

(2) Depressurized natural mining and utilization methods: a natural mining method of decompression natural mining is mainly to directly promote the hydrate in the well in the well by indirectly reduce the pressure of the hydrate to be pressed by pressurization. Natural mining. Using technology. The application of reduced pressure can be divided into two types: 1) The drilling is a single layer high-density high-quality cement filler drilling to meet the main purpose of achieving upper decompression; 2) When pumped into natural gas hydrated film, the lower part of the lower part of the upper layer is still unable to exist. The free gas or other high pressure fluid can directly extract all of the free gas or other high-pressure fluids below the upper layer of the hydrate membrane in the upper layer of the upper layer, thereby greatly reduces the air pressure temperature of the lower layer of the pumped natural gas hydrate film and Airflow pressure.

Direct injection and a large mining extraction method using natural gas organic chemical active reagent: Direct injection and a large mining extraction method using natural gas organic chemical active reagents, mainly to directly inject specific organic chemistry directly into these natural gas hydrate storage layers. Active reagent, such as silicate, methanol, ethanol, butanol, glycerol, etc., destroying these natural gas hydrate layers stored in the underground phase uniform liquid conditions, which causes these natural gas hydrates to be quickly decomposed. Although this chemical method can effectively reduce the initial chemical energy physical transport, its main defects are obvious, and the various chemical methods and cost costs they need are expensive, and the atmospheric layer of natural gas and organic hydrate is expensive. The oxidation impact is not only slow, but also likely to bring some environmental issues to future people's lives, so for this chemical method for scientific investment and research time

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spending relatively small.

### *1.2 New mining method*

(1) CO2 replacement fuel mining method. This design method is first proposed by Japanese researchers, and the method should still be atmospheric pressure of the natural gas hydrate stably. In a certain temperature and environment, the natural gas hydrate maintains stability is much higher than the CO2 hydrate. Therefore, in a particular pressure region, the hydrate in natural gas will be decomposed, and the CO2 hydrate is easily generated and can maintain stability. If in the refrigerated inner part of a natural gas hydrate reservoir, the CO2 gas will not be mixed with natural water that has been quickly decomposed from natural gas hydrates. New CO2 hydrates together. The huge heat released by this interaction can almost directly allow a natural gas hydrate to be continuously and continued in the process of rapid decomposition and chemical reaction in a dry air environment. [2]

(2) Solid oil and gas mining method: First, the main use is to collect various solid liquid natural gas hydrates in shallow water seabed in the direct manner, and the solid natural gas hydrate is directly dragged into a certain shallow water seabed area and decomposes the effective concentration control. In this way, it is developed into a mixed mining technology or is referred to as mineral mud mining technique. One of the main steps of the mixing soil is that the mixed earth mud consisting of mixed gas, liquid, solid hydrate is first decomposed by promoting the hydrate in natural gas to become a gas-liquid mixed soil, and the mixed earth mud consisting of mixing gas, liquid, solid hydrate is taken. This mixed soil mud is introduced to the work aircraft ship or production platform on the sea to promote the decomposition of hydrates in natural gas, thereby obtaining natural gas.

## 2. Present Situation of Combustible ice and Its Hazard

(1) We need to draw attention to the point is that, in order to produce combustible ice must be very low ambient temperature in the ocean, the relevant research shows that when the temperature of the environment exceeds 20℃, combustible ice physics major and chemical characteristics will change, that is, from one moment to the solid combustible gas, which is an important part of our ability to produce combustible ice of such substances in the sea; in addition, also required to have a greater potential pressure in general, the deeper the seabed potential pressure corresponding naturally larger, so that it includes a relatively stable potential pressure; combustible ice in the sea and thus the distribution will be more reasonable to ascertain such characteristics and distribution thereof also very instructive.

(2) Since some large modern people combustible ice was rediscovered, scientists are trying to study how to re-analyze and identify ways best suited to their continuous mining and integrated transport, but still no more feasible mining technology innovations proposed to them to carry out perfectly integrated mining. Research is currently in the hot product technical inspection method of testing phase of mining method mainly technical inspection intensification types include heat extraction process intensification, reduction pressing method, injection method and the like catalysts. Point is clearly needed, I want to make sure that eventually effective these different types of renewable energy recovery obtaining safe and efficient and possible to obtain sufficient utilization, environmental quality control of indoor air pollution containing methane and other inert gases and radiological quality control and management coordination of seawater temperature and atmospheric pressure will gradually become the must incorporate important to consider the environmental impact considerations. [3]

(3) If it is a large-scale mining, it will inevitably produce serious damage to the seabed soil and structure, or the marine continent is turbulend or the sea bed. In addition, various hydrates that are constructed in seabed sediments should also be particularly concerned, and once improperly disposal, it is easy to contaminate the submarine environment and causing adverse effects.

(4) How can effectively ensure efficient and saving of flammable ice, it is still in depth and analysis of many scientists. Although scientists have optimistic that there is approximately 1000 years of seabed for about 1000 years, we need to care about it is just an idealized resource comprehensive utilization. It is expected that this resource is highly efficient it is also tolerated to get a more systematic analysis and resolution.

For new mixed mining processing methods $CO_2$ replacement mixing mining method, it is necessary to minimize in a relatively dry low temperature storage area.$CO_2$/$CO_2$+$N_2$ hydrate is difficult to maintain steadily in a long time, which brings great security threat to the $CO_2$-based raw material storage and the maintenance repair process of the mining road map and the address. [4]

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## 3. Development and utilization analysis

(1) Since the flavor is present in the sea floor, they are in extreme low temperature, so they must be used as the main direction at a low temperature. At this point, we can use heat-insulating design to cope with it, and is integrated by temperature detectors and controllers.

(2) Be sure to ensure that it is stable in the seabed environment in the mining process to avoid contamination of methane or radioactive gas in the air, which is treated by the robot to treat these gases, which can reduce the chance of gas leakage to minimal Also helpful for safe transportation. Under the technical basis of temperature control of the ocean, the flammable ice is dissolved into the ocean warm water, and the stability and guarantee of the marine environment is achieved by cooperating with high-end controllers.

(3) In our first use of a deep sea geological camera, it is possible to check the change in deep sea terrain and the content of deep sea. Then we can use a piston-type deep-sea-heart sampling collector technology to complete Specific deep sea geological survey sampling. In addition, it is necessary to innovate exploration to analyze more convenient and efficiently analyze sampling and comprehensive survey analysis methods.

(4) For the environmental impede due to too light or water polishing changes, the environmental impede of the burning ice drilling can be considered to be treated accordingly by means of a dedicated air pressure gauge. The main purpose is to test and simulate the temperature and formation gas pressure in the region in the region, so that the temperature and formation air pressure in subsea air can be achieved, and the stability of the fuel-burning nature characteristics can be achieved.[5]

## 4. Prospection

At present, my country's currently imported energy-dependent ratio of natural oil has basically reached 60%, relying on a large number of natural coals and hydraulic power generation, thereby directly leading to environmentally friendly pollution problems caused by petroleum. With the rapid development of the energy market and the social economy, my country is currently growing to high efficiency, energy-saving technical requirements, and the natural geological exploration and resource development work of newly recyclable renewable energy is also gradually improved. The national "Twelfth Five-Year" development plan once again emphasized that it is necessary to continuously accelerate the acceleration of the stewardship of the energy industry and the optimization of the industrial infrastructure and the optimal construction of industrial basic supporting facilities. Exploring the important tasks of testing and mining. In November 2017, the Ministry of Land and Resources officially resumed approved the use of the burning energy source as the 173th new energy mineral in my country. Although my country has just started starting to start the new type of ignorant of Nanhai mining using technology, the first test mining in the South my country Sea last year has begun to further get further the research is improved. I believe that in the continuous improvement of national policies and regulations, theoretical and technical scientific application technology is increasingly updated and continuously improved, and the large scale can be used to use industrial mining scale and complete commercial South China Sea mining refers to the day.

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