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ARTICLE

COMPREHENSIVE TREATMENT TO REDUCE THE EMISSION OF AUTOMOBILE POLLUTANTS

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ABSTRACT

The petroleum and petrochemical are closely related to the automobile industry. And they are closed restricted and promoted each other. They have been developed coordinately, and become important products and tools indispensable to mankind civilization and social advances. Because of their very rapid development, their harmful effects have threatened mankind normal life and a favorable development of national economy. Therefore, comprehensive administration has to be adopted, national and local environment law s and discharge standards have to be worked out, in order to correctly solute the relationship among oil, automobile and environment. To ensure the rapid, coordinated and sound development of petroleum and petrochemical industry.

KEYWORDS

Industry, comprehensive administration, pollution

1. INTRODUCTION

Since 1745, when Russian businessman Pledunov established the world's first oil purification plant, mankind has started the history of utilizing petroleum products. But the use of petroleum products in internal combustion engines, as fuel for transportation, was in the late 19th century.

In 1796, the Frenchman Nicolas Günau built the world's first large-scale steam-powered tricycle with a speed of 0.8 kilometers per hour. Although steam-powered cars were commercialized in England in the 19th century, the internal combustion engine was only invented in 1878, followed by the appearance of light cars powered by internal combustion engines in Germany by Karl Benz in 1885 and Trib Daimler in 1886. The era of the automobile really began. Since then, oil and automobiles have become an inseparable pair of industries, restricting, promoting and coordinating development of each other, becoming indispensable materials and tools for human civilization and social progress, and making great contributions to the development of human society. At present, the world consumes about 3.4 billion tons of oil every year, of which about 70% is used for transportation (including roads, railways, waterways and aviation); the world's motor vehicle population is about 750 million, of which 4 are in use. About 660 million, and about 100 million motorcycles. It is certain that within the first 10 to 20 years of the next century, both oil processing and automobile production will be further developed.

However, everything has two sides. With the rapid development of the oil and automobile industries, its negative effects are increasingly manifested. In industrially developed countries, its negative effects have threatened people's normal life and the healthy development of the national economy, causing widespread concern, and a series of measures have been taken to minimize its negative effects, making oil and automobile Continue to contribute to the development of human society. China's oil consumption and car ownership are not large, and there is still a big gap compared with developed countries, but the development speed is very fast. In particular, our country's oil consumption and transportation vehicles are mostly concentrated in large and medium cities and economically developed areas, which makes the environmental problems caused by oil consumption and car driving more prominent. We must learn from the experience and lessons of industrialized countries, handle the relationship between oil, automobiles and the environment, and maintain their coordinated, healthy and rapid development.

2. POLLUTANTS EMITTED BY AUTOMOBILES AND THEIR HAZARDS

The power system of a car is the engine. According to the type of fuel used by the engine, it is divided into gasoline vehicles and diesel vehicles, as well as vehicles that use liquefied gas (LPG), natural gas (NG) and alcohols as engine fuels, but there are not many. The proportion is very small. Currently, among the 750 million motor vehicles, more than 70% are gasoline vehicles and about 20% are diesel vehicles. Therefore, reducing the emission of pollutants from gasoline and diesel vehicles is the main topic that we will discuss and study.

2.1 Pollutants emitted by automobiles

In the early 1980s, the World Organization for Environmental Health Cooperation and Development pointed out that vehicles used for transportation have become an important source of air pollution. According to statistics, in some developed countries, vehicle emissions

Table 1. Worldwide emissions of harmful substances from motor vehicles (1990)

Pollutants	Emissions / 100 million t	Proportion of various vehicle emissions, %			
		Cars	Heavy trucks	Light trucks	Motorcycles
CO	2.31	92	4	0.5	3.5
HC	0.39	77	7	2	14
Nox	0.32	42	50	6.5	1.5
CO2	39.69	53	37.5	16.5	3

have accounted for 30% to 60% of the total air pollution. There are three sources of exhaust pollution in automobiles: one is the exhaust pipe, which contains 98% to 99% of carbon monoxide (CO), 55% to 65% of hydrocarbons (HC) and 98% to 99% of nitrogen oxides (NO_X).) is discharged into the atmosphere by the exhaust pipe; the second is the crankcase, 1% to 2% of CO, 25% of HC and 1% to 2% of NO_X are discharged from the crankcase ventilation holes and the openings of the lubrication system. The third is the fuel system, where 10% to 20% of the HC discharges the fuel vapor into the atmosphere from the fuel tank and the carburetor. In addition to CO, HC, and NO_X, the pollutants emitted are particulate matter (Pm), which are soot particles produced by incomplete combustion of fuel, coke particles containing condensed aromatic hydrocarbons produced by the combustion of lubricating oil, and carbon particles in the fuel. It is composed of SO_2, SO_3 generated by sulfur and $CaSO_4$ particles generated by calcium in additives; sulfide (SO_X) is the combustion of sulfur in gasoline or diesel to generate sulfur oxides, which are discharged with the exhaust gas; lead oxides (PbO) is produced by the combustion of leaded gasoline. In addition, carbon dioxide (CO_2) in exhaust gas, chlorofluorocarbons (CFC'S) used in air conditioners, and asbestos in friction materials also have a certain impact on the human living environment. According to relevant information, each uncontrolled vehicle emits about 3kg of CO, 0.2 to 0.4kg of HC, and 0.05 to 0.15kg of NO_X per day. On average, about 42-70kg of harmful substances are produced for every 1t of fuel burned. At present, there are about 13 million vehicles in use in China, and the annual fuel consumption is about 40 million tons. According to this calculation, about 1.6 to 2.8 million tons of various harmful substances are produced each year, which is an astonishing amount.

In the early 1990s, some people made estimates on the emissions of various types of motor vehicles in the world. The total emissions of CO_2 were about 231 million tons, HC was about 39 million tons, NO_X was about 32 million tons, and CO_2 was about 3.969 billion tons. See Table 1 for details.

2.2 Harm of pollutants emitted by automobiles

(1) Lead (Pb)

About 70% of the lead in leaded gasoline is emitted into the atmosphere after being burned by the engine. About 60% of them can stay in the atmosphere for a long time because of their small particles, and become the main source of lead in urban air. Lead is an accumulated toxicant that accumulates much faster than it is excreted, and has a metabolic half-life of 4 years in the human body. Lead can damage the hematopoietic system, nervous system and reproductive system, and cause lesions in the liver, kidneys, and bones. Lead affects pregnant women and infants particularly seriously, and high blood lead levels can affect the normal physical and intellectual development of infants. It is estimated that every 10ug/kg increase in blood lead content in children will reduce the IQ level by 6 to 8 points. According to other data, every 10 units of blood lead increases, the language IQ decreases by 8 points, the operation IQ decreases by 7 points, and the total IQ decreases by 9 points. In 1991, the CDC organization has set the diagnostic criteria for lead poisoning in children as blood lead not greater than 10ug/dl. Children are particularly sensitive to lead pollution because the absorption of lead from the digestive tract of children is five times higher than that of adults. Even low levels of blood lead can have adverse effects on children's intellectual development and behavior, and the effects will be persistent.

(2) Carbon monoxide (CO)

Incomplete combustion of carbon or hydrocarbons will produce CO, and 90% of the CO in the air in major cities around the world (except Beijing) comes from vehicle emissions. CO is colorless and odorless, and it enters the blood to combine with hemoglobin, reducing the oxygen transport capacity of the blood. Even a small amount of CO will affect neurological function and visual acuity, which is more harmful to the infirm.

(3) Hydrocarbons (HC and VOC)

In addition to carbon monoxide, the incomplete combustion of gasoline and diesel may also contain unburned HC; engine ventilation and scavenging also emit some hydrocarbons; fuel tanks, carburetors, and gas stations may leak some volatile compounds. volatile hydrocarbons (VOCs). These HCs enter the atmosphere and mix with NOx. Under sunlight, ozone is easily generated and photochemical smog is formed. Low-altitude ozone damages the respiratory system and affects crop growth.

(4) Nitrogen oxides (NO_X)

NO_X is generated by the oxidation of nitrogen oxides in the fuel at high temperatures in the combustion chamber. NO_X is a yellow-brown gas that easily forms photochemical smog with HC in sunlight. Photochemical smog damages the respiratory system; causes bronchitis, pneumonia and other lung diseases. NO_X is also a major component of acid rain.

(5) Particulate Matter (Pm)

With carbon particles as the core, countless compounds are adsorbed and agglomerated on it, and more than 90% of the particles are less than 1um in diameter and can be suspended in the air for a long time. Many of these compounds are carcinogenic, even strong carcinogens. Suzuki, a chemist at Kyoto University in Japan, found that diesel exhaust contains a substance called 3-nitrobenzanthrone (3-NIT ROBENZANT HRO-NE), whose carcinogenic toxicity is much stronger than DINIT ROPYRENE, the strongest carcinogen known today. American studies have found that diesel engine exhaust contains more than 40 kinds of chemical components, which seriously affect people's health. The California state government has made a decision to regulate the use of diesel vehicles.

(6) Sulfur oxide (SO_X)

Sulfur oxides (SO_X) are formed after the combustion of sulfides in fuels. SO_X is one of the main substances that form acid rain. Sulfate in sulfide is one of the components of particulate matter.

(7) Greenhouse effect gas (CO_2)

For every 1kg of fuel consumed by a car, about 3.12kg of carbon dioxide (CO_2) is emitted. The world emits about 23 billion tons of CO_2 every year, and automobile emissions account for about 5% to 7%. The greenhouse effect gases emitted by automobiles also include CH_4, N_2O, CFCS, etc. Among them, CO_2, CFCS and CH_4 have a greater impact.

2.3 Vehicle exhaust has become the main source of urban air pollution

Air pollution is caused by many factors. However, in cities, due to the concentration of vehicles, the pollutants emitted by vehicles are mostly concentrated in the area about 1m above the ground, which is near the breathing zone of people, so the harm to people is particularly serious. As early as in the 1940s, Los Angeles in the United States and Tokyo in Japan in the 1970s had severe smog events. The reason was that HC and NO_X emitted by automobiles formed toxic photochemical smog under

the action of sunlight ultraviolet rays. As a result, hundreds of people have died, tens of thousands have been injured, trees have died and crop yields have been reduced. Photochemical smog has also occurred in cities such as New York, Chicago, Philadelphia, and London, UK.

The CO, SO_X, NO_X, HC and Pm emitted by automobiles can easily form "smog and temperature inversion" and become "health killers". Since the beginning of this century, there have been many air pollution incidents, of which 8 times have shocked the world. In December 1930, the phenomenon of "smog and temperature inversion" occurred in the Muse Valley region of Belgium, sickening thousands and killing more than 60 people. At the end of October 1948, the phenomenon of "smog and temperature inversion" occurred in the Domira region of the United States, causing more than 6,000 people to become sick and 17 people to die. From December 5th to 8th, 1952, two temperature inversion layers 15-40m above London were combined, and the fog and soot shrouded the entire urban area for a long time, causing thousands of residents to suffer from respiratory diseases. More than 4,000 people died in 4 days. In December 1962, there was another smog event in London, killing more than 700 people. In 1972, due to the occurrence of "smog and temperature inversion" in Yokkaichi, Japan, thousands of people suffered from bronchial lesions and more than 10 people died.

Of course, the formation of photochemical smog and the phenomenon of "smog and temperature inversion" is not entirely caused by automobile emissions, but to a large extent is related to the exhaust gas emitted by factories (especially untreated exhaust gas), various coal-fired boilers, and the smoke and dust emitted by stoves of residential life. However, there is no doubt that the exhaust gas emitted by automobiles is also a factor that cannot be ignored in the formation of photochemical smog and the phenomenon of "smoke and temperature inversion". In some areas and certain conditions, it may still be the main factor.

3. THE LEVEL OF AUTOMOBILE EMISSION CONTROL IN DEVELOPED COUNTRIES

Since the early 1950s, Professor Hagen Smit of the United States discovered that the exhaust gas emitted by automobiles is one of the main causes of "photochemical smog", and some countries have begun to study and formulate automobile emission control measures. The earliest proposed control of pollutant emissions from automobiles was in California, USA. After that, the US federal government, Japan, and European countries successively formulated regulations and standards to control vehicle pollutant emissions in different ways. These regulations and standards have been gradually improved, the test methods and test conditions have been improved, the instruments and equipment used have been gradually unified, and the controlled pollutants have expanded from the initial CO, HC and NO_X to particulate matter in exhaust gas and lead in fuel, sulfur, benzene, aromatic hydrocarbons and olefins, CFC'S for air conditioners, and asbestos for automobile friction materials.

3.1 TAKE A STEP-BY-STEP APPROACH

To control the pollution of automobile emissions to the environment, we must first improve the engine design, improve the combustion conditions of fuel in the engine, and minimize the generation of pollutants; secondly, improve the quality of the fuel and reduce the content of harmful substances in the fuel, such as lead, Sulfur, benzene, aromatic hydrocarbons, olefins, etc.; again, the catalytic converter is installed. The first step is to install an oxidative catalytic converter to convert CO and HC into CO_2 and H_2O. The second step is to install a three-effect oxidation and reduction type. The Three-Way Catalysts (TWC), in addition to oxidation, reduces NOx to harmless nitrogen. Taking the United States as an example, the control of automobile emission pollution has roughly gone through four stages.

(1) Internal purification

From 1968 to 1975, the United States first seized the in-flight purification. The engine manufacturer improved the structure of the combustion chamber, adjusted the nozzle position, reduced the volume of the crevice, improved the spray efficiency, adopted delayed ignition (TCS) and high-energy ignition (HF^1), shortened the flame afterburning time, and achieved lean combustion; improved the air intake system, Intake constant temperature preheating is adopted; crankcase gas return combustion (PCV) and exhaust gas recirculation combustion (EGR), secondary air injection combustion in the exhaust pipe; anti-evaporation measures in the fuel tank are adopted, and carbon canisters are added to make the gas in the exhaust gas. CO decreased by 67.6%, HC decreased by 71.2%, and NO_X decreased by 22.8%. After the promotion of the above-mentioned measures, the United States has significantly revised the emission standards (g/km): CO has dropped from 52.5 to 17, HC has dropped from 6.6 to 1.9, and NO_X has dropped from 2.5 to 1.93. , VOC is specified as 2 (g/test) by no control.

(2) External purification

Based on the completion of internal purification and the promotion of unleaded gasoline, automobiles were required to install oxidative catalytic converters in 1975 to further reduce CO and HC in exhaust gas. The CO index dropped from 17 to 9.3g/km, and the HC dropped from 1.9 to 0.93g/km. Furthermore, in 1979, automobiles were required to install three-way catalytic converters to reduce CO, HC and NO_X again. At the same time, the United States revised the emission index (g/km): CO decreased from 9.3 to 4.3, HC decreased from 0.93 to 0.75, NO_X decreased from 1.93 to 1.24, and the VOC index was still 2 (g/test).

(3) Electronic ignition with direct fuel injection

In the early 1980s, on the basis of the general use of unleaded gasoline and gasoline with detergents, automobile engines gradually adopted single-point direct fuel injection, open-loop control, or multi-point fuel direct injection, closed-loop control, and used computers to control air/fuel. The oxygen sensor is installed to ensure complete combustion of fuel under various working conditions, minimizing pollutant emissions, improving engine specific power and reducing fuel consumption. In foreign countries, float carburetors have been quickly replaced by electronic injection systems. After the promotion of this technology, compared with the uncontrolled state, the CO reduction rate of the exhaust gas can reach 96%, the HC reduction rate reaches 96.2%, and the NO_X reduction rate reaches 74.8%, and the effect is very obvious. Therefore, the United States revised the emission index (g/km) again: CO decreased from 4.3 to 2.1, NO_X decreased from 1.24 to 0.63, and HC and VOC indexes were not changed.

(4) Formulate air cleansing law to promote new formula gasoline

In 1990, the U.S. Congress approved the Clean Air Act Amendments, requiring the promotion of Reformulated Gasoline (RFG) containing oxygenated compounds in 41 areas with excess CO and 9 areas with excess ozone. In addition to not being allowed to add lead, reformulated gasoline also has strict regulations on benzene, sulfur, vapor pressure, distillation range, and oxygen content. Today, two-thirds of gasoline sold in the U.S. is reformulated, and it is becoming more popular. The reformulated gasoline can reduce the HC emission rate to 97.7%, the NO_X reduction rate to 90%, and the CO reduction rate to keep above 96%. In 1994, the United States revised the vehicle emission target (g/km) again: CO and VOC indicators were not changed, HC was reduced to 0.15, and NO_X was 0.25. At the same time, the *Clean Air Law* also puts forward stricter requirements on the content of aromatics and sulfur in diesel.

(5) Foreign Vehicle Emission Standards

There are three major systems of automobile emission regulations and standards in the world today, the United States, Japan and Europe, and other countries basically adopt or formulate these three systems.

(6) Current Vehicle Emission Standards in the United States

The United States is the country with the strictest control of automobile pollutant emissions in the world. California, in particular, often makes regulations 1-2 years ahead of the federal government, and the indicators are also stricter than the federal government. U.S. vehicle emission standards are shown in Tables 2 and 3.

(1) The metrics for passenger cars and light trucks in the table are the 50,000-mile endurance limit.

(2) The compliance rate for the 1994 model year was 40%, in 1995 it was 50%, and in 1996 it was 100%.

Table 2. Gasoline vehicle emission limits in U.S. (1996)

Vehicle type	Emissions				Idle speed	Evaporative Emissions g/ Test	Crankcase emissions
	CO	HC	NO	Pm			
Cars	2.1	0.16	0.26	0.05			
Light trucks	2.1	0.16	0.25	0.16	0.5	2	Exhaust to atmosphere is not allowed
Heavy trucks	2.8	0.2	0.44	0.08	0.5		

Table 3. Diesel vehicle emission limits in U.S. (1996)

Vehicle type	Emissions				Smoke	Crankcase emissions
	CO	HC	Nox	Pm		
Heavy-duty diesel vehicles	15	1.3	5	0.1	Acceleration 20 Loading deceleration 15 Peak 50	Exhaust to atmosphere is not allowed.
Diesel cars and light trucks	Cars and light trucks have exactly the same emission requirements as gasoline cars and light trucks, except for evaporative emissions and smoke levels.					

(3) GVW is the gross vehicle weight.

(4) g/bhph is grams/brake horsepower × hour

(7) Japan's current vehicle emission standards

Emission regulations in Japan are enforced nationwide. For newly developed models, control is carried out by means of type approval. Japan has also established a type recognition system for tailpipe emission control, as well as special treatment measures for imported vehicles.

(8) Current vehicle emission standards in europe

European vehicle emission standards, which were formulated by the Economic Commission for Europe (ECE) in the past, were revised every 4 to 5 years. But once adopted by the European Community (EEC) and now the European Union (EU), it was transformed into a directive regulation.

As people's voice for environmental protection grows louder, vehicle emission standards will become more and more stringent in the future. At present, the US Federal Environmental Protection Agency (EPA) has formulated the next-step vehicle emission standard, which requires that the current level-1 gasoline vehicle emission standard be further improved to the level-2 standard, that is, HC is less than 0.08g/km, and CO is less than 1.08g/km. 1g/km, NO_X is less than 0.13g/km.

4. CURRENT SITUATION AND CONTROL MEASURES OF AUTOMOBILE EMISSIONS IN CHINA

Since 1984, when our country issued the emission limits and measurement methods such as idling emissions of gasoline vehicles, free acceleration smoke of diesel vehicles, and full-load smoke of automobile diesel engines, after several revisions, now in addition to diesel vehicle emissions and particulates, the emission limits and measurement methods have been covered. Cars emit most of the pollutants. After more than 10 years of governance, our country's vehicle emission levels have also improved to a certain extent. However, compared with developed countries, it is still in its infancy. In some areas, the pollution of urban air caused by automobile emissions is still very prominent.

4.1 Urban air pollution has become very serious

Since oil only accounts for 19.7% of our country's total primary energy consumption and vehicle fuel is only 40-45 million tons, nationally, vehicle emissions are unlikely to be the main cause of air pollution in our country. However, with the continuous increase of car ownership, and because most of our cars are concentrated in large or medium cities, for example, the car ownership in Beijing accounts for about 1/10 of the country. In addition, the construction of urban roads in our country is lagging behind, the speed of vehicles is relatively low, and the overloading of some trucks is common, which will increase the emissions of CO, HC, NO_X and Pm. According to the analysis of monitoring data in 1996, the daily exceeding rate of SO_2 concentration in the central area of Beijing reached 10% to 15%, the exceeding rate of CO and NO_X concentration was over 20%, and the daily exceeding rate reached 60% to 70%. At the maximum concentration, CO, NO_X and SO_2 exceed 1 to 3 times the national level 2 standard. The air pollutants in Beijing, in addition to SO_2 and soot mainly from coal combustion, CO, NO_X 85% of emissions from transportation vehicles. The lead concentration in the air in some provinces and cities reaches 1-1.5ug/m3, and in some areas it is as high as 14-25ug/m3, while the standard set by the World Health Organization is 0.5ug/m3 (annual average).

Due to serious air pollution, the phenomenon of "smog and temperature inversion" has appeared in many cities in our country, and it is becoming more and more serious. From December 1997 to February 1998, heavy fog and temperature inversion occurred continuously in most parts of our country, which not only blocked roads, railways, waterways and aviation, but also greatly affected people's life, work, and even production. According to observations in Beijing, the thickness of the atmospheric inversion layer once reached more than 300 meters during the heating period, and the frequency of occurrence was as high as 50%. There are more than 120 smog days in the downtown area throughout the year, the average daily visibility is less than 2 km, and the visibility in extreme cases is less than 50 meters. The urban areas within the Second Ring Road have created conditions for the accumulation of pollutants to form acid mist or photochemical smog. If no effective measures are taken, air pollution events that will shock the world are likely to occur.

Shenzhen has developed rapidly since the reform and opening up, but the environmental management work has not kept up, resulting in the deterioration of urban air quality. In the 1970s, there were only 5 days of "haze" foggy weather; in the 1980s, it developed to 59 days. All these show that urban air pollution in our country has reached a level that cannot be ignored and must be treated.

4.2 Comprehensive management measures must be taken

To control urban air pollution, it is not only necessary to solve the pollution of automobile emissions, but also to solve the pollution of exhaust gas from factories, power plants, heating projects and various coal-fired boilers in order to improve the urban fuel gasification rate, improve the greening of the city and surrounding areas, reduce bare ground and so on. To control automobile emission pollution, we must start from improving the design of automobiles, and first do a good job in the purification of the machine; at the same time, improve the quality of gasoline and diesel, realize the unleaded gasoline, and reduce the content of sulfur, benzene, aromatic hydrocarbons and other harmful

substances in gasoline and diesel. On this basis, the exhaust gas catalytic converter will be gradually promoted.

(1) Pay close attention to the scrapping and elimination of old vehicles

According to tests, the CO and HC emissions of Jiefang, Dongfeng and various vehicles with 492 engines are equivalent to 15 to 20 times the emissions of controlled vehicles abroad, before they are controlled. In particular, the old cars produced before the 1980s that have been driven for many years are mostly in disrepair and are generally in poor condition with serious excess emissions. In 1997, the State Economic and Trade Commission, the State Planning Commission, the Ministry of Internal Trade, the Ministry of Machinery Industry, the Ministry of Public Security and the State Environmental Protection Administration jointly revised and issued the "Automobile Scrap Standard", which requires light and micro trucks to travel 300,000 km in total. , the cumulative driving distance of heavy-duty trucks is 400,000 km, the cumulative driving distance of extra-large, medium, light and miniature passenger cars and sedans is 500,000 km, and the cumulative driving distance of other vehicles is 450,000 km. All types of taxis have been used for 8 years, and other vehicles have been used for more than 10 years; the long-term use of vehicles whose fuel consumption exceeds 15% of the value specified in the factory standard of the national stereotyped vehicles, etc., should be scrapped. This scrapping standard should be carefully implemented.

(2) Pay close attention to the implementation of in-machine purification

Referring to the successful experience abroad, we need to improve the engine design, improve the intake system, ignition system and combustion system, and adopt measures such as Pressure Controlled Ventilation (PCV) combustion and Exhaust Gas Recirculation (EGR) combustion to reduce fuel consumption. Strive to make pollutant emissions reach the level of the 1970s in the United States.

(3) Pay close attention to improving the quality of gasoline and diesel

Leaded gasoline must be eliminated by 2000, and heavy taxes will be imposed on those producing and using leaded gasoline. Quickly upgrade and replace gasoline, cancel low-grade No. 70 gasoline, and expand the proportion of high-grade gasoline such as No. 90 and No. 95 (97). Revise national standards to limit the content of sulfur and benzene in gasoline. Create conditions for the promotion and installation of catalytic converters in automobiles. At the same time, the standard of diesel fuel for vehicles is formulated, the content of sulfur and aromatic hydrocarbons is strictly limited, and the cetane number cannot be lower than 45.

(4) Planned promotion of catalytic converters

Before 2000, based on the completion of unleaded gasoline, the use of oxidative catalytic converters was promoted. The fuel system adopts electronically controlled fuel injection technology, and the computer controls the air/fuel ratio, so that our country's automobile emissions reach the level of 1975 or the mid-to-late 1980s in Europe, namely: CO <10g/km, HC <1.0g/km, NO_X <2. 0g/km, VOC<2g/test. Around 2005, the use of three-way catalytic converters was promoted, and the sulfur content of vehicle diesel was reduced to 0.05%, making our country's vehicle emissions reach the level of the 1990s in Europe. In 2010, it will be synchronized with the international control level.

4.3 Revise and improve vehicle emission standards

First of all, it is necessary to find out the air pollution status of major cities and regions in our country, the impact of major industries or industries on the environment, and the sources and share rates of major pollutants. Secondly, it is necessary to find out the emission levels of the main vehicles in use in our country and provide a scientific basis for formulating technical regulations and emission standards. At present, our country has frequently issued 7 mandatory motor vehicle air pollutant emission standards and more than 10 pollutant measurement methods. However, the overall level is not high, and product certification has not yet started. There is no requirement for the quality assurance system of the production plant, and there is no sampling inspection system, and the consistency of the products is poor; there is no requirement for the durability of automobile emissions, and no recycling system has been established; there is still a lack of scientific classification for the existing models, and the inspection and identification work brings some difficulties. These all need to be improved and perfected. In the first half of this year, the State Machinery Bureau announced a new control target for vehicle emissions: vehicles with a total weight equal to or less than 3.5t will implement stricter emission limits on July 1, reducing CO emissions by 66%, HC and NO_X. By 2002, CO emissions will be reduced by 94%, HC and NO_X by 98%, and heavy-duty diesel vehicles will reduce CO emissions by 71%, HC by 69%, and NO_X by 61% by 2004. We expect this goal to be achieved.

4.4 Establish local regulations and emission standards

Referring to foreign experience, for cities and regions with relatively high concentration of vehicles and serious pollution, we should promptly formulate local environmental protection regulations and vehicle emission standards. For example, Beijing, Shanghai, Tianjin, Chongqing, Shenzhen and other places should take the lead in formulating such regulations and standards. Beijing has promulgated the "Light Vehicle Exhaust Pollutant Emission Standards" this year, which stipulates that CO emissions should not exceed 3.16 g/km, HC and NO_X should not exceed 1.13 g/km, and Pm of diesel vehicles should not exceed 0.18 g/km. km, the requirements will be implemented from January 1, 1999. This is the country's first local emission standard, which is much stricter than our country's current standard, equivalent to the European vehicle emission standard in 1992. With this new standard, the limit on exhaust pollutants is about 85% stricter than the current national standard, and the fuel economy will also be improved. Beijing's new emission standards apply to newly manufactured light-duty vehicles. Light-duty vehicles sold and licensed in Beijing from January 1, 1999 must meet this standard, otherwise they will not be allowed to be sold or licensed. For some small car manufacturers or companies with relatively backward technology, their products may be rejected from Beijing. We also expect new local regulations and emission standards to emerge in the future. With national and local environmental protection regulations and emission standards, it is also necessary to strengthen their supervision and implementation. In 1987, Beijing began to implement annual inspections on motor vehicle exhaust emissions, and only those who passed the inspection were allowed to go on the road. However, only about 40% of the motor vehicles that pass the annual inspection pass the road inspection. This shows that, on the one hand, it is necessary to improve the quality of annual inspections, and on the other hand, it is necessary to strengthen the intensity of road inspections. In short, after comprehensive treatment, our country's vehicle emission level will be greatly improved, and our country's urban air quality will also be significantly improved.

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