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REPAIR OF MOTOR VEHICLE TIRES

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ANNOTATION
This article covers topics such as tire recovery, the current problem of waste tire recycling, ways to dispose of used car tires, and physical methods of tire recycling.

KEYWORDS: microbiological effects, high-quality materials, textile yarns, barodestructive tires, "dilution", ecological and economic

INTRODUCTION

In recent years, production and consumption wastes are increasing in many countries, including the problem of the use of old car tires, which is one of the polymer wastes. The problem of using old tires is of great environmental importance, because old tires accumulate in their places of operation (vehicles, airfields, industrial and agricultural enterprises, mining and processing plants, etc.).

Tires thrown into landfills or scattered in the surrounding areas pollute the environment for a long time due to their high resistance to external factors (sunlight, oxygen, ozone, microbiological effects). Their places of accumulation, especially in regions with a warm climate, serve as convenient habitats and breeding grounds for rodents and insects suffering from various diseases. In addition, tires have a high fire risk, and the products of their uncontrolled combustion have a very harmful effect on the environment. The problem of using old tires is also of great economic importance, because the economy's need for natural resources is constantly growing and their value is constantly increasing. In addition to rubber with technical characteristics close to the original, the use of used tires, which contain a large amount of reinforcing textile threads and metal materials, provides an opportunity to save natural resources. The economic importance of using waste tires is determined by the fact that the extraction of natural resources is expensive and in some cases limited. Therefore, the use of waste tires is becoming increasingly important. In addition, the disposal of tire waste allows for the purposeful use of large areas of land occupied by them.

MAIN PART

Used tires are one of the largest polymer wastes. According to estimates, about 2 million tons of car tires are produced in Europe, 2.8 million tons in the USA, and 3 million pieces in Uzbekistan. There is an urgent problem of recycling waste tires. Since the tire has to withstand extreme loads, it is made of complex elements of high-quality materials, it consists of 15 components. Tire soles, sidewalls and sides are made of special rubber compounds. The frame is mainly made of viscose silk or complex polyester, the inner part of the sides is made of steel. The average composition of a typical passenger car tire is

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86% rubber, 10% steel wire and 4% textile fibers. Thus, 1 ton of tires consists of almost 600-650 kg of rubber, 130-150 kg of textile threads, and 130-200 kg of metal. It should be noted that cushion tires are valuable secondary raw materials containing 65-70% rubber, 15-25% technical carbon, 10-15% high-quality metal. There are the following ways of disposing of used car tires: Burying tires. The simplest way to dispose of used tires is to bury them. Since old car tires do not break down, they do not pose a threat to the environment, but because they take up a lot of space, it is forbidden to throw them in landfills. Buried tires reduce the risk of fire. Using whole tires. This method of recycling tires does not need an explanation from an ecological and economic point of view. Barodestructive tire processing technology-The technology is based on the phenomenon of "liquefaction" of rubber at high pressure and its exit through the holes of a special chamber. At the same time, rubber, textile threads are separated from the metal wire, from the rings, crushed and come out of the holes in the form of initial pieces of rubber, which undergo further processing. Metal wires are removed from the chamber in the form of compressed briquettes. Tire processing using cryogenic technologies. Low-temperature processing of old tires when the rubber is in a brittle state is carried out by crushing at temperatures from -600 C to -90 0 C. Experimental studies have shown that grinding at low temperatures significantly reduces the energy consumption for grinding, improves the separation of metal and textile products from rubber, and increases the yield of rubber. Possible uses of cover rubber. Powdered rubber with a particle size of 0.2 to 0.45 mm is used as an additive (5-20%) in rubber compounds for the production of new car tires, solid tires and other rubber products. The use of rubber powder with a highly developed specific surface (2500-3500 cm2 /g) of particles obtained as a result of mechanical grinding increases the resistance of tires to bending and impact, increases their service life. Chemical methods of tire processing. Burn tires for energy. From an ecological point of view, the use of used tires for energy production is controversial. When burning tire rubber, a large number of extremely toxic compounds are formed, in addition, hydroxides of sulfur, carbon and nitrogen are formed. They start acid rain, and also absorb harmful compounds due to their high sorption capacity, even if they are not a toxic element, and become very toxic. Ozone processing of tires. Ozone interacting with the surface of rubber leads to rapid oxidation, that is, it leads to the destruction of intermolecular and intramolecular interactions. Close ties are destroyed especially intensively. Therefore, when microcracks appear or exist on the rubber surface, ozone first attacks the molecules located at the top of the cracks. This causes cracks to grow rapidly and the material to break into pieces with relatively smooth surfaces. The situation is reminiscent of low-temperature cryogenic destruction. However, due to ozone attack, the surface of the parts is oxidized, that is, the molecular weight decreases on the surface and oxygenated rubber oxidation products appear. Tire pyrolysis. Pyrolysis of waste tires - in developed countries (the USA, Japan, Germany, Switzerland, etc.), pilot plants for pyrolysis of used tires with a production capacity of 7-15 thousand tons per year have been operating for a long time. Pyrolysis of tire and rubber scraps is carried out in an oxygen-free environment. But pyrolysis of old tires is not used in practice, since most of these devices work in a cyclic mode, and the resulting pyrolysis products require additional cleaning before further use, and most importantly, the costs are not covered by the price of the materials obtained. At the same time, "Energe Research International" (USA) can

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process 1 million car wheels per year in its "Reactor" block, more than 600 liters of diesel fuel from 1 ton of tires, 227 kg of high-quality technical carbon and 130- Obtaining 180 kg of steel wire improved pyrolysis technology. In Canada, it is planned to build a pyrolysis plant, which will produce 10,000 tons per year, using the technology of processing tires under vacuum. In England, a 50,000 ton/year tire processing plant was put into operation by pyrolysis at a temperature of 350-500°C in an oxygen-free environment. 3-4 thousand tons of light distillate, 17 thousand tons of coal-like solid fuel and 5-7 thousand tons of metal are obtained at this plant.

CONCLUSION

Thus, as a result of the analysis of modern literature, it was found that environmental problems can be eliminated by disposal of used car tires, as well as there are opportunities to obtain raw materials for the production of important products for the national economy, especially motor fuels, through chemical processing of tires.

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