POLICY OF THE RUSSIAN FEDERATION AND FOREIGN COUNTRIES IN THE SPHERE OF UTILIZATION AND RECYCLING OF WASTE

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Abstract:

In paper experience of foreign countries in the sphere of utilization and a recycling of waste is investigated, its positive components for the purpose of their adaptation to modern Russian realities are revealed. Considering that in Russia at a modern level of development of technology from 9% to 25% of initial raw materials finally goes to waste, at the existing and again opened enterprises it is necessary to introduce a complex control system of rational use of secondary raw materials. The complex system has to include actions of scientific and technical character, economic; ecological. The importance of research of ways of recycling of production of basalt fibres, mineral fibre, metallurgy and development of technology of briquetting of waste of basalt fibres with various physical and mechanical characteristics with application of the binding is proved in the press way. The directions of increase of efficiency of industrial production as a result of processing of production wastes of basalt fibres are revealed.

Introduction

"In chemistry, there is no waste, and there are unused raw materials" (D. I. Mendeleyev). The main problem of the XXI century is the level of natural resources use and degradation of environment. The ecological researches moved many countries showed that today the problem of waste which poses threat to the basis of existence of the person is especially distinguished from environmental problems (Babikova et al., 2014). The task of ensuring the sustainable economic, social and ecological development assuming reasonable use of resources of the nature for an exception of global environmental disaster is set for all states of the world.

In Russian territories of about 7 billion tons of solid waste of metallurgical, machine-building, mining and chemical productions, and also waste of fuel and energy complex are annually formed. Accumulation, storage and recycling of industrial productions on grounds and dumps conduct to dangerous environmental pollution, irrational use of natural resources and, as a result, to significant economic damage. Officially in the Russian Federation under grounds and dumps of solid industrial wastes about 10 thousand hectares of lands, suitable for use, are annually allocated. Unfortunately, there is also huge number of unauthorized dumps (www.gks.ru).

On volumes, structure and the maintenance of useful components the saved-up waste is comparable with the used fields of natural minerals. The created scientific and technical potential in the circumstances shows need of competent raw reorientation of metallurgical, machine-building, mining and chemical industry, and also fuel and energy complex.

1. The analysis of foreign policy in the sphere of utilization and a recycling of waste

The general installations of the European Union on environmental issues and resources consumptions (to which also the address with waste belongs) are stated in the foundation agreement of the EU of 1957 in the section "Environment". According to this contract, one of the key tasks facing the EU "assistance to the high level of protection and improvement of quality of environment" is.

In the mid-seventies of the XX century in Western Europe and North America started applying the principle of integrated management of utilization and a recycling of industrial productions waste, world-wide recognized today. At the All-European meeting on cooperation in environmental protection in Geneva in 1979 "The declaration on low-waste and waste-free technology and use of waste" where in rather full look the concept waste-free technology is formulated is adopted special. At a meeting of the working group in 1989 definition of pure production was given: "this production which is characterized by continuous and full application to processes and products of the nature protection strategy preventing environmental pollution so that to lower risk for mankind and environment".

Improvement of a control system of waste admits the main problem in the field of environmental protection today. The main steps were determined by the solution of this problem at the International conference on a sustainable development in Johannesburg in September, 2002. They include "prevention and minimization of waste and the maximum reuse, secondary processing of resources; and also the use of alternative ecologically safe materials assuming participation of the governments and all interested parties with the purpose to minimize an adverse effect on environment and to increase efficiency of resources" (http://www.johannesburgsummit.org).

The general task of the Ecological Action program of the EU is achievement "higher resource effectiveness and the best resource management and waste for providing steadier models of production and consumption; destroying interrelation between use of resources, formation of waste and level of economic growth. Finally, it is necessary to aspire to that consumption of renewable and non-renewable resources didn't exceed environment capacity".

2. Russian experience in the sphere of utilization and recycling of waste

The first state act of secondary raw materials in Russia is Peter I's decree of April 24, 1714 about collecting and use of waste of a canvas. For realization of norms and provisions of the Law "About Environmental Protection" in Russia the Resolution of the Government of the Russian Federation N 1098 created of 13.09.1996 the Federal target Waste program. A program task - to reach annual processing and use of 55 million tons of waste and economy of 20-25% of material resources, and also reduction of the area of the earth alienated under waste with prospect of creation of the capacious market of resource-saving, environmentally friendly and low-waste technologies, and also technologies on processing and a recycling of waste. This program is actual and in the next years.

In 1998 in Russia the special Federal law "About production wastes and consumption" is adopted. This law which is further development of the Law RSFSR "About protection of surrounding environment" defines a state policy in the field of the address with production wastes and consumption. The "Ecological doctrine of the Russian Federation" approved by the Order of the Government of the Russian Federation of August 31, 2002 No. 1225-r among the main, priority directions of a state policy in the field of ecology defines the direction of development systems of secondary resources use, including - processing of waste (recycling), and also introduction of resource-saving and waste-free technologies in all spheres of economic activity. Unfortunately, this document doesn't provide an integrated approach in questions of environmental protection and management of recycling process. The standard and legal base created on its basis still causes disagreements among experts. So far development of an effective state policy in the sphere of the address with waste isn't complete.
Basic strategic documents of the Russian Federation in the field of environmental protection and environmental management are: "Bases of a state policy in the field of ecological development of the Russian Federation for the period till 2030" (further – Bases), approved as the President of the Russian Federation on April 30, 2012; and the Plan of action on realization "Bases of a state policy in the field of ecological development of the Russian Federation for the period till 2030", N 2423-r approved by the order of the Government of the Russian Federation of December 18, 2012. On January 5, 2016 the Russian President Vladimir Putin signed the Decree on carrying out in 2017 in the Russian Federation Year of ecology. Its carrying out is planned for drawing attention of society to questions of ecological development of Russia, preservation of biological diversity and ensuring ecological safety. Since January 1, 2016 project documentation and results of engineering researches on objects of placement or neutralization of waste of the I-V classes of danger are subject to state examination.

3. The perspective directions of the Russian policy in the sphere of utilization and a recycling of waste

The Russian Federation possesses one of the most powerful around the world industrial potential. Due to not faultlessness of technological processes at this stage inevitably negative impact of the industry on environment, industrial wastes as component of this influence. It is counted that at a modern level of development of technology 9%-25 of % of initial raw materials finally goes to waste. At the existing and again opened enterprises it is necessary to introduce a complex control system of rational use of secondary raw materials. Have to enter into complex system actions of scientific and technical character, economic (intraeconomic planning of education, collecting, use and realization of waste, establishment of the prices of these resources and products of their processing, material stimulation of their rational application, the complex account and the analysis of results of work with secondary raw materials); ecological (use of secondary raw materials taking into account aspects of environment protection) (Dudin et al., 2014).

Organizational and methodical, normative and technical and its legal basis are standards and certification of secondary resources. According to GOST 25916-83 "Resources material secondary (terms and definitions)", belong to production wastes: the remains of raw materials, materials, the semi-finished products formed at production or performance of work and the initial consumer properties which lost in whole or in part, and to consumption waste – the products and materials which lost the consumer properties as a result of physical or an obsolescence. The main tendency in the sphere of waste management at us and in the developed countries of the world is their minimization in the following ways (Zaytsev, 2012):

- prevention or reduction of formation of waste (i.e. waste-free or low-waste production);
- improvements of quality of the formed waste, including reduction of amount of toxic substances in them;
- recycling, restoration or extraction of useful components from them.

In the majority of the countries the following priority row in the address with waste is observed: prevention of formation of waste has a priority before their repeated use;

- the reuse or recycling in the same process is more preferable than external use;
- use of waste is more preferable than use of their energy (received, for example, by burning); however in Germany, Korea and Switzerland both directions have equal priority;
- in all countries the reuse or restoration (extraction) has an unconditional priority before warehousing or burial;
- in a number of the countries burning of waste belongs to the category "minimization", only in case of energy use.

Processing of industrial wastes has to be a component of technology on which they are formed. Basalt composite and hybrid materials and technologies are included in the section "New Materials and Chemical Products" "List of the priority directions of development of science and equipment and critical technologies of Federal level", approved by the Government commission on scientific and technical policy of the Russian Federation. In recent years in the industrial developed world considerable success in resource-saving and in the field of environmental protection is achieved. Despite prescription and a large number of researches in the field of environmentally friendly production, one of the most actual problems utilization of the industrial wastes posing serious ecological threat is now (Zhang & Yang, 2013). However, it is necessary to deal with a problem of utilization and processing of production wastes not only from a position of environmental protection, but also from the point of view of an economic benefit when waste is cheap raw materials (Šikýř, 2011).

While, for example, in the USA, Japan, Germany, countries of Western Europe processing of secondary raw materials allowed to create environmentally friendly technologies, to make restructuring of a number of industries, in Russia a share of use of such waste as secondary raw materials the very low. The complexes working abroad not only carry out important ecological and economic tasks of the state value, but also are the highly profitable enterprises. Their income consists of a payment for acceptance of material for processing (the supplier saves transportation costs on delivery to a place of a dump and a payment for a dump) and the income from sale of secondary material which is cheaper natural and sale is provided to it (Sun, 2015).

In Russia not enough attention is paid to resource-saving, the ecological situation considerably worsened. Steps taken recently on creation of "pure" productions and modernization of old capacities solve the problem only partly. Trying to reduce own expenses, the enterprises utilize the waste by their burial on special grounds. There is a classification of waste by their chemical nature, technological signs of education, opportunity to further processing and uses. In Russia harmful substances it is characterized on four classes of danger on what costs of processing and burial depend. Any waste can be considered as secondary material resources. They can be used in the economic purposes, or partially (i.e. as an additive), or completely replacing traditional types of material and raw and fuel and energy resources. Their considerable part represents commercial interest. There are productions on processing of the specified waste. Nevertheless, the considerable part of waste doesn't gather and isn't processed.

4. Value of technology on processing of production wastes of basalt

Object of this research are production wastes of basalt fibres of a number of the Russian plants. Because of a long-term disproportion between volumes formed (to 30% daily) and the liquidated waste a significant amount of dump masses in the form of basalt fibres of various thicknesses are collected. This waste is large-tonnage.

Producers of basalt and mineral fibres in Russia are domestic plants, and the branches of industrial concerns from other countries which developed shops in the Russian territory. Except the conventional leaders, the set of small enterprises on production of basalt and mineral-fibres heaters is about the country scattered, whose production is less known and demanded. The group of leaders in production of mineral-fibres heat-insulating materials in Russia includes some leading enterprises:

- TechnoNIKOL company – The Russian producer who placed the enterprises not only for all country but also in the neighbouring countries (the former partners across the USSR) and the countries of Europe. The distribution network has representations more than in 30 countries. Production is calculated on private and industrial application.
- The Rockwool concern (Denmark) – has an extensive network of the enterprises united in joint stock company "Mineral fibres ". Let out various mineral- fibres production for all elements designs, household and industrial function. Specialize on use of raw materials of basalt breeds.
- The Isofate company – a domestic production with foreign shareholders (100% foreign capital). Let out products from stone fibres at plant in Tambov, constructed in the eighties the last century and passed modernization.
- The company Ekover – the beginner in the sphere of production of basalt mineral- fibres heaters, whose production which is let out in the Urals wins the increasing popularity in all regions.

By estimates of analysts, in Russia, by the last calculations, more than 40 plants of the most various scale work with output more than 25000 thousand m3 a year. Because of low bulk density waste of these productions is large-tonnage and occupies the huge spaces of dumps and grounds. For example, a plant with the productivity up to 150 kg/h (per day about 100m3 at the density of 35 kg/m3) lets out per day to 35 m3 of waste of basalt fibres. Large producers have productivity of 1 ton per hour and above. Waste reaches 30% on some productions. In 2009 in Russia the Rockwool Concern (Denmark) developed technology of recycling of basalt fibres and constructed briquette plant in the territory of the enterprise to Vyborg, having enclosed in development of technology and the equipment of 8 million euros.
Now at all enterprises ROCKWOOL in Russia is exposed to secondary processing of 80% of waste. Actively in the Russian market offers the technology of utilization and the FAS Hansek GmbH & Co Company line KG, CEO Claus-Dieter Hansek. Chinese with the offers catch up. For example, the Polotsk plant of fiber glass (Republic of Belarus) applies experience of use of waste of basalt fibres, glass fibre in road construction and as additives at production of a brick. However at such use completely waste isn't utilized.

To a deep regret, today in Russia there is no enterprise making automatic transfer lines with a big productivity for processing of waste. Generally all lines arrive to us from abroad. Relevance of the organization of production of the high-performance line to utilization and a recycling of waste of industrial productions - is obvious. Ways of utilization of basalt waste Sakha-Yakutia and other plants look for the TechnoNIKOL Company, SMALLPOX of PTK "Sudogda", JSC Uralasbest, "Plant of basalt materials" (Sakha Basalt). Again opened plants buy foreign

technologies and lines on utilization. Nevertheless, these technologies have high cost and can't gain mass distribution. Domestic plants are interested in development of technology of recycling in vast scales, in development and selection of the domestic equipment.

Now in Russia results of former scientific development regarding use of production wastes in construction and production of construction materials poorly take root, new researches are slowly conducted. At the same time only in production of basalt and mineral fiber the exit of waste annually makes more than 10 million t. One of the main problems of recycling of basalt cotton wool, heterogeneity of structure of waste (firm, soft, eliminations and so forth) which can't almost be divided also their low bulk density is. The purpose of work is research of ways of recycling of production of basalt cotton wool, mineral fibre, metallurgy and development of technology of briquetting of waste of basalt cotton wool with various physical and mechanical characteristics in the press way with application binding. For achievement of a goal it is necessary to solve the following problems (Lyasnikov et al., 2014):

- to study domestic and foreign experience of recycling of production of basalt fibres, mineral fibre, metallurgical industry;
- to establish the existing problems and the directions of constructive and technological improvement;
- to investigate the general and specific regularities of process of formation of techno genic materials with various physical and mechanical characteristics, to develop technical ways for their realization;
- to conduct researches of chemical, mineralogical and particle size distribution of waste of basalt fibres;
- to investigate influence of humidity on processing of waste in briquettes;
- to investigate quality of a grinding of waste of basalt fibres on laboratory equipment;
- to investigate influence of type and the contents binding on durability of briquettes;
- to conduct researches of influence of processing of briquettes as secondary raw materials on productivity of production of basalt super thin fibre, basalt thin fibre;
- to develop manufacturing techniques of briquettes from basalt waste of basalt super thin fibre, basalt thin fibre on the basis of theoretical and pilot studies.

Practically all manufacturers of mineral, basalt, glass fibers still prefer to take out waste on grounds and dumps, thereby reducing the potential profit. Costs of collecting, transportation and placement in storages, and also on purchase of additional raw materials are added to costs of production. Besides, waste has destructive influence on environment and threatens health to the population. All formed basalt waste is located in close proximity to the enterprises doesn't demand huge costs of their investigation and development (Boyko, Sekerin & Šafránková, 2014). Their processing and on the squares and further recycling in production will allow increasing the production efficiency considerably:

- decrease in costs of purchase of raw materials to 30%;
- increase in productivity of installation to 15%;
- reduction of places of warehousing of waste in territories of the enterprises - producers;
- lack of costs of transportation and storage of waste on dumps;
- receiving the material which isn't conceding in the parameters to the existing analogies;
- decrease in electricity consumption when recycling raw materials;
- ecological safety;
- effect for the average enterprise can reach to 10 million rubbles a year.

Conclusion

Thus, in paper experience of foreign countries in the sphere of utilization and a recycling of waste is investigated, its positive components for the purpose of their adaptation to modern Russian realities are revealed. Considering that in Russia at a modern level of development of technology 9%-25 of % of initial raw materials finally goes to waste, at the existing and again opened enterprises it is necessary to introduce a complex control system of rational use of secondary raw materials. The complex system has to include actions of scientific and technical character, economic (planning of education, collecting, use and realization of waste, establishment of the prices of these resources and products of their processing, material stimulation of their rational application, the complex account and the analysis of results of work with secondary raw materials); ecological (use of secondary raw materials taking into account aspects of environment protection).

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