

## THE ROLE OF WASTE AS A VALUABLE SUBSTANCE

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### **Abstract**

*Dispatch of waste is waste related to labor, electricity, heat, reduced productivity of capital equipment, production of raw materials, production and processing of raw materials, and loss of size.*

### **Key words**

*waste, binders, cement clinker, chemical composition of cement, mineralogical structure, industrial waste, rock, sedimentary rocks, stone slag of blast furnaces, nephilin clay, slate clay, clay.*

Fasteners are of great importance in the construction industry. They provide an opportunity to carry out various constructions, from the repair of houses to the construction of the most complex and responsible structures. A comparison of statistics on the production of binders shows that cement and gypsum play the main role. Currently, the demand for cement production worldwide is increasing year by year. The development of the science of binders in our country, the successes achieved in the physico-chemical field of silicates create important scientific conditions for the complex use of mineral raw materials in the production industry of binders. There are several studies on the integrated use of raw materials.

In general, although progress has been made in the complex processing of raw materials, the problem of using industrial waste remains as relevant as before. One hundred million tons of various waste collected cannot be considered completely useless, useless mineral raw materials.

In many cases, improving the composition of waste or their production technology is complicated by the specificity of the main process. We witness such a situation when burning fuel, because the possibilities of adjusting the properties of mineral residues are very limited. Therefore, it takes a long time to collect a lot of waste along with the main product, and therefore their use requires a lot of attention from scientists, engineers, and economists.

In this regard, two options are distinguished: a) working with waste whose

physical and chemical properties cannot be adjusted; b) obtaining additional substances with certain properties by adjusting the main technological process.

Many wastes are close to cement in chemical and mineralogical composition. Therefore, we need to conduct more scientific research on the technology of turning waste into cement, which is the most important construction material. We find the following cases where industrial waste is effectively used in cement production:

stone from blast furnaces for the production of binders;

chalcedony is added to correct the composition of cement raw materials;

nepheline slurry for the production of binders;

ash for cement production;

Portland cement waste used to speed up the cooking of the raw material mixture.

The waste accumulated in old landfills usually does not have significant properties, so it is possible to monitor and change the production mode and the intended properties of the final product only depending on the composition of the raw material mixture. It is desirable to use it mainly as raw material. In the production of Portland cement, mineral waste can be used as a raw material for cement clinker or as additives for various purposes in grinding.

It is known that limestone and clay, characterized by the variety of chemical and mineralogical composition characteristic of most sedimentary rocks, are the most suitable raw materials for cement production. This affects the cement production technology, the main aspects of this technology are high grinding and uniform mixing of raw materials, as well as ensuring the adjustment of the composition of the raw material mixture. Production control, large areas, capacity (sludge basins, silos, bunkers for storing raw powder) serve to timely identify and correct inconsistencies in the composition of the mixture. This allows the use of raw materials with a very different chemical composition, including many wastes of enterprises. Such wastes are particularly rich in silicates, aluminates and calcium ferrites with or close to the mineral composition that gives rise to the properties of cement clinker.

At present, the issue of using industrial waste as raw material for cement is hardly controversial. But despite this, the construction of new factories for the production of cement from natural raw materials continues even in the lands where there is a lot of industrial waste suitable for cement production. During the construction of cement factories in industrial districts, the first batch of waste processing and cement production should be carried out in the fall.

The use of waste also greatly benefits the primary production due to the excess

consumption of labor, electricity, heat, reduced productivity of the main equipment, as well as inefficient costs associated with finding and processing excess raw materials and waste disposal.

It should be said that inefficient costs in the use of waste can be added to the price of cement to a certain extent, as a result of which the technical and economic indicators of cement and base production will increase.

The use of waste in cement production has the following advantages:

a) reducing the amount of processed raw materials, such as mining, grinding, sometimes even turning into powder (for example, when using highly crushed slag, fly ash, self-crushed stone, powdered phosphogypsum, etc.) energy consumption. decreases due to the abandonment of preparation processes;

b) increases labor productivity of some aggregates;

d) reduces the amount spent on the search for new deposits of cement raw materials, because millions of tons of waste are polluting industrial areas;

g) extends the service life of furnaces and mills;

d) ten million tons of raw materials are processed annually, which allows this sector to occupy one of the leading positions in waste processing.

Since the use of waste is particularly effective in the cement industry, we felt it necessary to first introduce the students to cement technology.

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