

## WASTE IS A VALUABLE RAW MATERIAL

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### **Anotatsiya**

*Currently, the issue of using industrial waste as raw material for cement production is becoming a priority. However, in areas where there is a lot of industrial waste suitable for cement production, the creation of an industrial zone from natural raw materials and their waste, i.e. The construction of cement factories in industrial areas is primarily aimed at recycling waste and using it on a large scale. Recycling just these wastes to improve the environment brings great benefits. The use of waste, especially in the cement industry, will not be without advantages of national importance, since it is highly efficient.*

### **Key words**

*waste, ecology, industrial waste, waste processing, creation of mineral composition from waste, stone slag of blast furnaces, nephiline sludge, slate sludge, waste used to speed up the production of cement, raw materials obtained by grinding waste.*

Binders are of great importance in the construction industry. They provide an opportunity to carry out a variety of 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 physical and chemical field of silicates create important scientific conditions for the complex use of mineral raw materials in the binders production industry. There are several studies on the integrated use of raw materials.

In general, although successes have been achieved in the complex processing of raw materials, the problem of using industrial waste remains as relevant as before. Hundred million tons of accumulated various wastes cannot be considered completely useless, unusable mineral raw materials.

In many cases, improving the composition of waste or the technology of their production 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 extremely limited. Therefore, it takes a long time to collect a lot of waste together with the main product, and therefore, their use requires great attention from scientists, engineers and economists.

In this regard, two options stand out: a) working with waste whose physical and chemical properties cannot be adjusted; b) obtaining additional substances with certain properties by adjusting the basic technological process.

Many wastes are close to cement in terms of their chemical and mineralogical composition. That is why we need to conduct more scientific research on the technology of turning waste into cement, the most important building 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;

slane ash for cement production;

waste used to accelerate the baking of Portland cement raw material mixture.

The waste accumulated in old landfills usually does not have significant properties, therefore, it is only possible to monitor and change the production mode and the intended properties of the final product depending on the composition of the raw material mixture. It is appropriate to use it mainly as a 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 during 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 technology of cement production, 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 spaces, capacities (sludge basins, silos, bunkers where raw material powder is stored) serve to timely identify and correct inconsistencies in the composition of the mixture. This makes it possible to use raw materials with a very different chemical composition, including many wastes of enterprises. Such wastes are especially rich in silicates, aluminates and calcium ferrite, which have or are close to the composition of minerals that give rise to the properties of cement clinker.

At present, the issue of using industrial waste as raw material for cement is almost not contested. However, in spite of this, construction of new factories for

making cement from natural raw materials is still going on even in the lands where there is a lot of industrial waste suitable for cement production. During the construction of cement factories in industrial regions, the first batch of waste processing and cement extraction should be done in autumn.

The use of waste also greatly benefits the main production due to the excess consumption of labor, electricity, heat, reduced productivity of the main equipment, as well as unproductive costs associated with finding and processing excess raw materials and waste disposal.

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

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

a) reducing the amount of raw materials to be processed, and such as mining, grinding, sometimes even turning into powder (for example, when using highly crushed slurry, powdered ash, self-crushing rock, powdered phosphogypsum, etc.) electricity consumption is reduced due to the abandonment of preparation processes;

b) increases labor productivity of some aggregates;

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

g) extends the working life of furnaces and mills;

d) annually processes ten million tons of raw materials, which allows this industry to take one of the leading positions in terms of waste processing.

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

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