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The Place of Magnesium Compounds on Industrial Scale

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One of the main directions of economic development is the integrated use of local raw materials and the creation of production technology that can replace competitive imported products. Another important priority for the long-term perspective, which is crucial for increasing the potential, strength and competitiveness of our economy, is active investment in the implementation of strategic projects aimed at modernization of key sectors, technical and technological renewal, development of transport and infrastructure communications. policy [1]

The demand of the developing economy of the Republic for mineral resources, including magnesium compounds, is growing day by day. Magnesium compounds are used in the chemical industry in the production of various defoliants in the light and energy industries, construction (cement production), medicine, as a raw material for the production of magnetic metal, ie in the production of various alloys, as well as thermal recovery of titanium and silicon. As an apparatus in the textile industry, when soaking wooden construction products to increase their fire resistance, its solutions are used as antifreeze, in order to protect the rail arrows from freezing [2].

The use of cheap defoliants based on bischofites (magnesium chloride hexahydrate) in agricultural developing countries leads to a significant reduction in the cost of production of raw cotton.

Similarly, the use of bischofites in the energy industry of Uzbekistan plays an important role in the combustion of high levels of sulfur in crude oil. The building materials manufacturing industry also requires the use of large quantities of bischofites in the production of magnesium cement.

Thus, the demand for magnesium chloride, sodium chloride in the economy of the Republic of Uzbekistan is high and intersectoral: the demand for this raw material is very high in the chemical, metallurgical, energy, pharmaceutical and other industries.

Currently, the demand for this product is met only at the expense of imports and very high costs. Other similar costs lead to an increase in the market price of the finished product.

The value of magnesium compounds makes it uncompetitive not only in the domestic market but also in the foreign market. At present, the country does not produce magnesium chloride, in particular, there are significant reserves for industry.

Lakes Karaumbet and Borsakelmas serve as an important source for the production of rapeseed magnesium compounds. The reserves of Lake Karaumbet are estimated at 3365 thousand tons of NaCl, 2181 thousand tons of Na2SO4, 700 thousand tons of MgS12.

Sodium chloride obtained by the way is sent to the Kungrad soda plant as a raw material, which leads to a reduction in the cost of production of magnesium chloride [3].

Thus, the complex processing of Karaumbet and Borsakelmas lakes rap and the development of technology for the production of calcium sulfate digitrate, sodium chloride and magnesium chloride hexahydrate is one of the current problems.

The data collected to date show that there is no possibility to develop a single energy-saving technological scheme for the processing of sulfate-chloride type rap. This is due to the fact that the sources of raw materials differ in composition. For example, the high content of sodium chloride in raw materials requires the discovery of cost-effective ways to separate it from rapeseed. Low salt content requires an increase in rape concentration.

There are different ways to process rap. For example, bischofite can be isolated from ocean water, where the precipitation of magnesium ions is carried out by lime, the resulting sediment suspension is carbonized with water. During the carbonization process, the magnesium in the Mg (ON) 2 suspension is converted into a magnesium solution and converted to magnesium bicarbonate. It is converted in the presence of magnesium chloride to form a solution of sodium bicarbonate and magnesium chloride [4].

MgNSO3 precipitate is calcined to obtain soda, and magnesium chloride solution is used to obtain bischofite. However, the disadvantage of this method is that a large amount of lime is required to obtain the reagents (SaO and SO2),

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secondly, the evaporation of the solution is required. This method is unsuitable for processing saline solutions containing sulfate ions.

There are also methods for obtaining table salt (sodium chloride), ie concentrated magnesium chloride solution and pure magnesium oxide from saline solutions. The process includes the production of calcium chloride by interaction of NSl with lime, desulfurization of saline solution with calcium chloride, production of sodium chloride by natural evaporation of water in solar baths, processing of saline solution by natural evaporation to obtain concentrated magnesium chloride, drying of the final solution and obtaining high quality magnesium oxide and NS1 acid as a result of burning it, including calcium chloride extraction at the beginning of the process.

Magnesium can be used in conjunction with the production of VaS12 from VaS.

VaS12 - VaS12 and barium hydrosulfide can be obtained by processing with a solution:

2VaS + SaS12 + 2N2O = VaS12 + Va (NS) 2 + Va (ON) 2

The solution of VaS12 and Va (NS) 2 is treated with a solution of MgS12 after the separation of Ca (ON) 2 precipitate from it:

Va (NS) 2+ MgS12 + 2N2O = Mg (ON) 2 + VaS12 + 2N2S

The filtered and washed Mg (ON) 2 precipitate is converted to magnesium by firing.

To obtain VaS, Mg (ON) 2 precipitate is easily separated from the solution, the solution is saturated with N2S, and its pH is reduced.

Soda method of obtaining light magnesium. This method is quite old and involves the precipitation of basic magnesium carbonate by treating soluble magnesium salts (MgSO4, Mg (NSO3) 2 and MgS12) with soda. Industrial solutions of natural and magnesium salts, as well as magnesites are used as raw materials.

In a magnesium ball mill, the particles are ground to a size of 0.2-0.1 mm and diluted with 28% N2SO4 and heated to boiling point by steam. The resulting magnesium sulfate is purified from iron Fe + 2, Fe + 3 ions with chlorinated lime and precipitated in the form of Fe (ON) 3. The purified MgSO4 solution is treated with 10-12% soda. The suspension in which the basic magnesium bicarbonate precipitates is treated with boiling steam, after which the following coupling reaction can take place:

4MgSO4 + N2SO3 + 4N2O = 3MgSO3 + Mg (ON) 2 + 3N2O +

+ 4Mg2SO4 + SO2

The precipitate is filtered, washed and dried - a light white powder - magnesium alpha is obtained. This method is also used to obtain magnesium from a lake saline solution [6].

However, the disadvantages of this method outweigh the advantages: the complexity of the technological process, that is, consisting of several separate stages, requires a complex structure of devices, which are made of expensive, corrosion-resistant materials; multistage and technological processes take a long time, especially the processes of precipitation of sodium chloride and carnallite by natural evaporation and evaporation of the saline solution, as well as high corrosion activity of NS1 in the final saline solution [7].

Thus, desulfurization and two-stage evaporation with distilled liquid processed for the purpose of winter and summer sedimentation of Karaumbet and Borsakelmas lakes requires active work and its application in practice.

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