

ANALYSIS OF METHODS FOR DISPOSAL OF OIL REFINING INDUSTRY WASTE

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Abstract: *this article analyzes the methods of oil sludge utilization, indicating the advantages and disadvantages of these methods, and also proposes a method of electric fire technology with environmentally friendly combustion of fuel briquettes.*

At the moment, there is a situation of reducing the world's energy reserves, in connection with which a modern and competent approach to the disposal of petroleum products that can significantly increase the efficiency of using energy reserves. At the same time, a particularly acute problem is the organization of competent disposal of waste from oil refining production, with the help of which the industry can not only significantly improve the environmental situation in the region, but also significantly increase its economic potential.

Currently, methods of utilization of oil sludge can be classified into: thermal - combustion in open barns, furnaces of various types, obtaining bituminous residues, burning oil sludge in the form of 23 water emulsions and utilization of released heat and gases, dehydration or drying of oil sludge with the return of oil products to production; physical - mixing and physical separation of oil sludge; chemical - extraction with solvents, curing with additives; physicochemical - the use of specially selected reagents (solvents, demulsifiers, surfactants, etc.) that change the physicochemical properties, followed by processing on special equipment; Let us consider in more detail the methods of processing oil sludge, indicating the advantages and disadvantages of the above methods.

1) Thermal methods of oil sludge processing: incineration in open barns; combustion in furnaces of various types and designs; thermal drying; pyrolysis. As a result of thermal processing of oil sludge, semi-coke, liquid pyrolysis product and synthesis gas are obtained.

The process of incineration of oil sludge is a type of processing that is expensive and requires a certain amount of time. During the implementation of this process, all hydrocarbons are destroyed, which are quite valuable products and are used in various processes. In addition, the surrounding air is polluted with very toxic substances. The process diagram is shown in Figure 1.

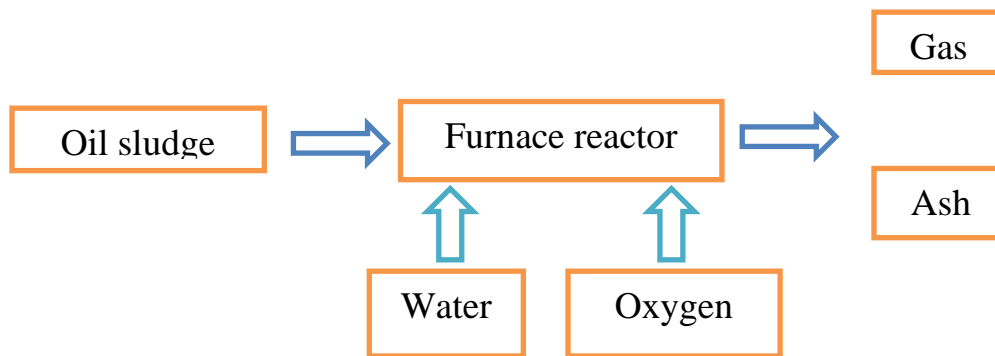


Fig.1. Scheme of the combustion process of oil sludge

These methods do not require large capital expenditures, they are used for many types of waste, a high degree of decomposition, and the obtaining of valuable products. The disadvantages of the thermal method include high costs for cleaning and neutralizing flue gases, incomplete combustion of oil products, and a high risk of contamination of the air basin with combustion products.

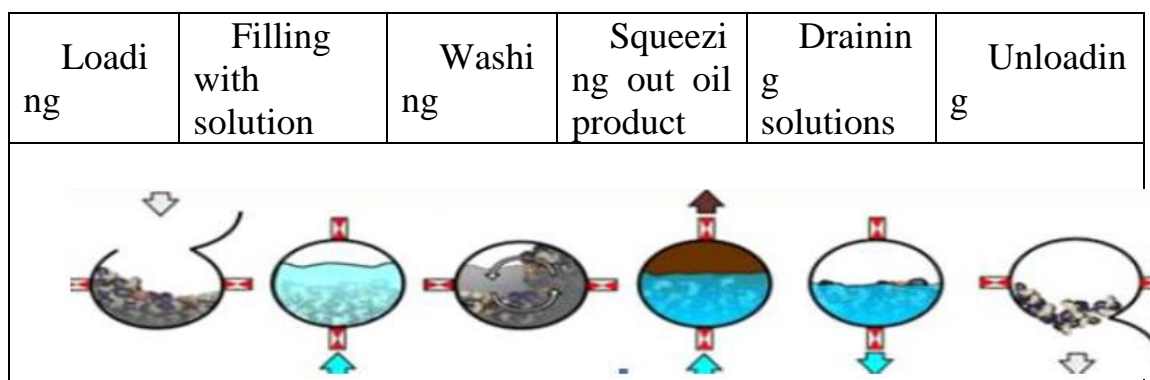
2) Physical methods of oil sludge processing: separation of waste in a centrifugal field; gravitational settling.

Sedimentation of oil sludge is a method that is a very slow process that does not bring the desired effect, both in technological and environmental terms.

To apply this method, it is necessary to use significant amounts of certain chemicals, as well as to look for large areas of land for the placement of oil waste settling tanks, which is difficult for those enterprises that do not have large areas for using waste for these purposes.

The processing of oil sludge by the filtration method consists in filtration using a special press, the process diagram is presented in table 1. This method is the most common method of processing. In the process of this method, the liquid and the impurities contained in it are separated. The disadvantages of this method are low throughput, the problem with the disposal of material that is filtered, which leads to an environmental threat.

Table 1. Scheme of the oil sludge filtration process



3) Chemical methods of oil sludge processing: solidification by dispersion with reagents; oxidation; neutralization. High efficiency of the process of processing oily waste. The disadvantages include the use of special equipment and reagents.

4) Physicochemical methods of oil sludge processing: the use of specially selected surfactants - demulsifiers.

This method has a high cost of reagents, as well as the formation of non-utilized solid waste.

In the modern world, these methods for processing oil sludge are a little outdated, and they are gradually losing their popularity. In their place come more advanced and relatively inexpensive methods. Although the methods of oil sludge disposal are aimed at improving the environmental situation in the world, they can also be much more harmful to the environment than their absence.

The analysis of the above methods showed that each of these known technologies has its own advantages and disadvantages. Nevertheless, even now, many useful products are actually obtained from oil sludge, in particular, commercial oil, fuel for boiler installations, and some building materials. The main disadvantage of all known technologies for the processing and disposal of oil sludge is low productivity and high energy, material and financial costs for their implementation. In addition, they do not allow for complete and intensive processing and disposal of oil sludge, especially with the utmost environmental safety for the environment. It is these shortcomings that do not allow to effectively solve the problem of complete and intensive utilization of various oil sludge.

References

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