

Nonwaste technology of receipt of guminovikh fertilizers is from peat

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Abstract - Every country tries to be independent in everything, above all things it is for this purpose needed to have a high level of the use of own power resources. In connection with a power crisis actual is a transition from traditional energy sources to complex introduction of alternative. The complex processing of peat was probed on a fuel and extracting humic substances for the production of fertilizers..

Keywords - humic substances, peat, fertilizers, fuel, extraction.

Introduction

One of sources of alternative types of fuel there is peat which is the cheap type of fuel for a population, raw material for nourishing soils and organo-mineral fertilizers.

Humus substances - specific complexes of organic compounds of complex structure. They are divided into two main groups: a group of dark-colored humic acids, in which distinguish humic acids (gray), ulmic acids (brown) and alcohol-soluble hematotic acids and a group of yellow-colored fulvic acids. Humic and fulvic acids taken together are called "humic substances".

An important source of humic substances is peat. Basically, peat is used for fuel and local fertilizers. If you remove humic substances from it and burn the rest, then this unique natural resource can be used more rationally. The main method of obtaining humic substances - is an alkaline reaction with solutions of ammonia or potassium hydroxide, sodium. Such treatment converts them into water-soluble salts - gumat potassium or sodium with high biological activity.

The composition of the functional groups and the structure of the molecular fragments of humic acids depends on the method of their obtaining [1].

Classical technology for the extraction of humic substances using chemical methods is based on the high temperature of the mixture, which requires high energy consumption.

We have proposed the use instead of traditional hydromechanical devices, pulsed devices of discrete pulsed energy input (DPEI) [2].

The results of the research are presented in Fig. 1.

As can be seen from Fig. 1, the lowest indices of the yield of humic substances at an extraction temperature of 20 ° C in dry peat are extracted more intensively. For comparison, a control sample obtained by conventional extraction technology at 133 ° C was investigated. The efficiency of extracting humic component from the developed technology in a pulsating apparatus of a cavitation type was investigated. The amount of sequestered humic substances is 1.4 times more than the control sample. Also, according to the developed technology, extraction from dry and milling peat occurs with the same amount of sequestered humic substances, therefore it is inappropriate to dry the peat before extraction. The extraction is carried out in a cavitation type apparatus with the same intensity for 20 minutes, 40 minutes. and 60 min Based on these studies, extraction was performed in the pulsating apparatus of DIVE for 20 minutes.

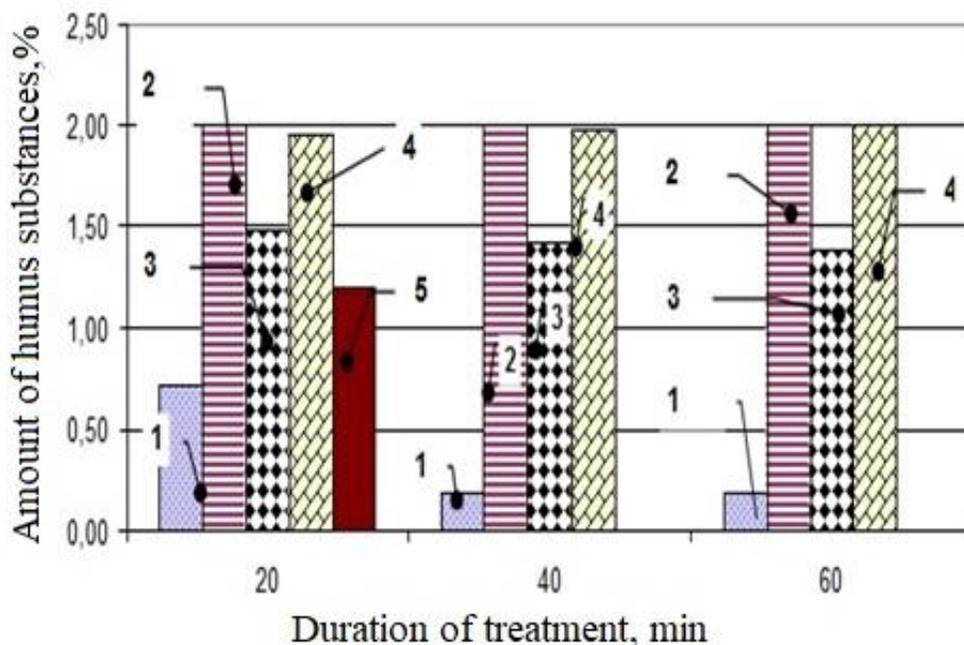


Fig. 1. Effect of mechano-thermal treatment of peat on the output of humic component

- 1 - "dry" peat at a temperature of 20 ° C; 2 - "dry" peat at a temperature of 60 ° C;
 3 - milling peat at temperature 20 ° C; 4 - milling peat at a temperature of 60 ° C;
 5 - control sample

Conclusion

The developed technology will allow the maximum extraction of humic substances from peat with a significant decrease in temperature and extraction time, followed by the use of liquid fraction as a fertilizer, and solid residue - after extraction for the production of cheap fuel.

The use of cavitation in the technologies of obtaining humic preparations makes it possible to achieve their high physiological activity, a large yield of water-soluble organic substances, the occurrence of reactions of hydrothermal synthesis.

References

- [1] Zh. O Petrova, "Investigation of the modes of extraction of humus and humic substances", Scientific works ONACHT, edition. 47, vol. 2, pp. 190-194, 2015.
- [2] O.I. Chaika, L.P. Gozhenko, G.K. Ivanitsky, D.M. Korinchuk, "Intefication of the process of dispersing low-grade peat with the use of a pulsating dispersant", Promyshlennaya teplotekhnika, vol. 35, no. 5, pp. 22-28, 2013.