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METHOD FOR OBTAINING POWDER-LIKE COMPOSITE CHEMICAL PREPARATIONS BASED ON LOCAL RAW MATERIALS AND PRODUCTION WASTE

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ABSTRACT

The results of the study of the structures, compositions, and physicochemical properties of the ingredients are presented. The possibility of using them in the development of composite chemicals for treating cotton seeds is shown.

KEYWORDS

Cotton seeds, chemical reagent, chemical technology, gossypol resin, caustic soda, sodium salts, carboxylic acids, carbolic acids, alumac, seed disinfectant.

INTRODUCTION

The disinfection of seeds is of paramount importance in the fight against both gummosis and root rot, for which various methods of pre-sowing treatment are

used, such as mechanical, physical, mechano-chemical, chemical and combined methods of processing cotton seeds. A more effective method is the mechanical-

chemical method of seed treatment of agricultural crops [1-3]. However, the chemicals used are either expensive or not effective enough. In this regard, the development of highly effective, affordable, cheap chemicals, as well as composite materials based on local raw materials and production waste used for the pre-sowing treatment of cotton, is an urgent problem [4-7].

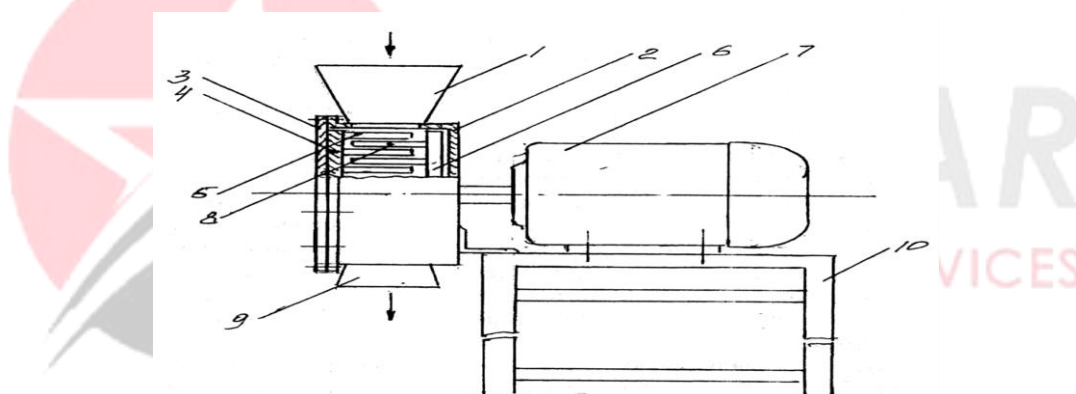
OBJECTS OF THE STUDY

For the development of composite chemical preparation, we chose gossypol resin, Na-carboxymethylcellulose (Na-CMC), polyacrylamide (PAA), caustic soda, soda ash, household water, and

alumak, waste from the production and processing of non-ferrous metals, as objects of study.

METHODS

The methods used by us to obtain and determine the physicochemical, as well as technological parameters of chemical reagent samples using nedal and other ingredients, as well as drilling fluids based on them, are as follows: First of all, nedopal and other ingredients are dried in an oven at 105 ± 5 °C for 2 hours until the residual humidity is not more than 2%. Then they are subjected to dispersion in a grinder (Fig. 1) to a particle size of 20-50 microns.



1-pipe branch; 2- body; 3-caps; 4.6-disk; 5th element;

7-electric motor; 8-fingers; 9-exit window; 10-frame

Figure 1. Scheme of the installation for dispersing ingredients

The basic principle of operation of the grinder is as follows: the dried nedopal is fed into the grinder, consisting of a loading pipe 1, a body 2, a cover 3, inside of which there is a fixed disk 4 with elements 5 fixed concentrically around the circumference, a movable (rotating) disk 6, and mounted on the shaft of the

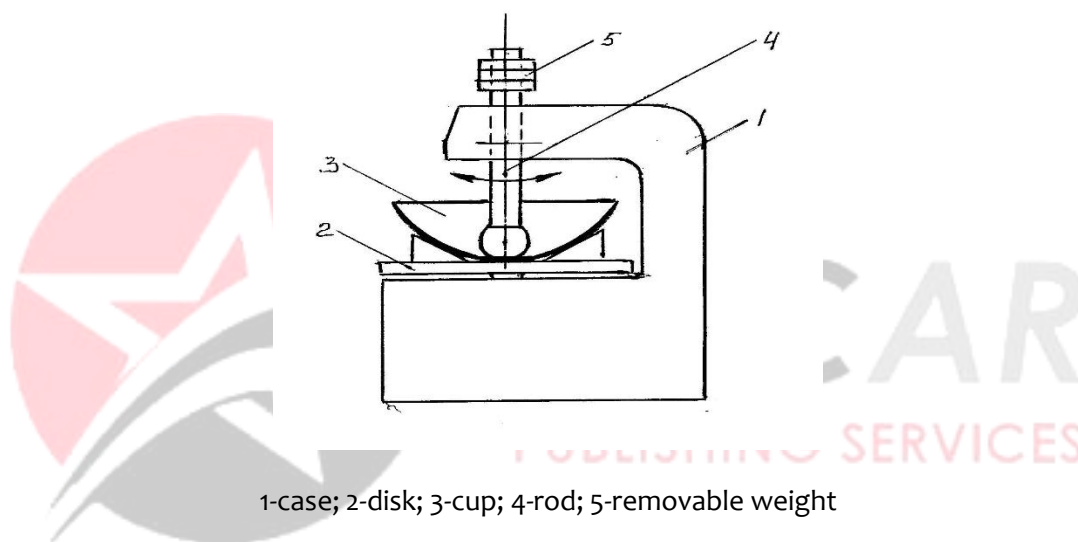
motor 7. The disk 6 on the end plane contains the fingers 8, concentrically located around the circumference of the disk. The disc fingers enter the gap between the circles of the concentrically located segments. At the bottom of body 2, there is an exit window 9. The grinder is mounted on frame 10.

In the grinding process of the nedopal - from the nozzle 1, the material, falling into the zone of the rotating disk 6, is subjected to impact due to the element 5 and rapidly rotating fingers 8. The nedopal in crushed form exits through window 9.

Samples of composite chemical reagents containing nedopal are prepared as follows: 20 grams of nedopal are weighed on an analytical balance with an accuracy of ± 0.5 g. Then 80 g of powdered chemical reagent brand KPM-SK-2 based on gossypol resin is weighed.

The weighed components are thoroughly mixed in a mechanical mortar (Fig. 2) until a homogeneous powder is formed.

Rod 4 performs arcuate horizontal vibrations, which ensures good abrasion and mixing of chemicals in the cup 3. The rod 4 is equipped with removable weights 5, which provide different degrees of abrasion of materials.



1-case; 2-disk; 3-cup; 4-rod; 5-removable weight

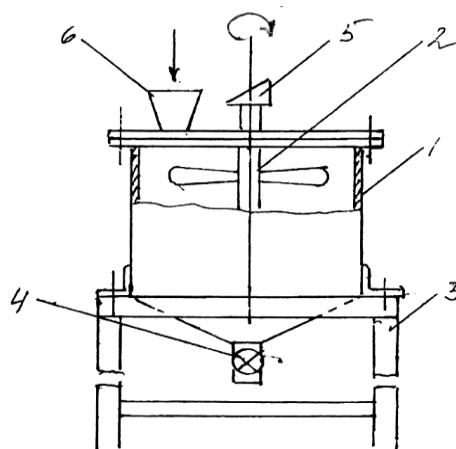
Figure 2. Scheme of a mechanical mortar

The principle of operation of a mechanical mortar: various chemicals are poured into cup 3, and mortar 4 is switched on. After thorough mixing and grinding of the resulting composition, the mortar stops, the cup is released from the composition and the process is repeated.

Chemical solutions were obtained during the installation, the scheme of which is shown in Fig.3. The

plant consists of tank 1, mixer 2, frame 3, valve 4, mixer drive 5 and loading pipe 6.

The process of preparing chemical solutions is as follows: a solvent is poured into the loading pipe 6, the powder is poured, and with the help of a rotating mixer 2, the powder is completely dissolved. When valve 4 is opened, the finished solution leaves container 1.



1-capacity; 2-mixer; 3-frame; 4-valve; 5-drive

Figure 3. Installation scheme for obtaining chemical solutions

From the resulting composition, a sample is taken for the preparation of chemical solutions. Depending on the required density, viscosity, fluid loss, degree of shear stress and crusting thickness, a solution of various concentrations is prepared at the plant (Fig. 3) by dissolving in water. A sample is taken at room temperature in the required amount for conducting comprehensive studies of the physicochemical and technological properties of samples of chemical solutions obtained based on composite chemical reagents [8-10].

Determination of the physical characteristics of powder ingredients, and physicochemical and technological characteristics of chemical solutions obtained on their basis is carried out using standard methods, which are discussed below.

CONCLUSION

Technological equipment for the production line for the production of composite powdered gossypol

preparations for cultivation and cultivation of crops, including tanks with shutters for bulk mineral ingredients, a screw feeder with a drive, a grinder for obtaining a finely divided preparation and a conveyor packaging line, was prepared and installed.

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