Получение нового хлората, содержащего комплексную активность дефолианта

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Abstract: *the dependence of solution physico-chemical properties changing from components compositions in aqua system including calcium, magnesium chlorates, chlorides and mono ethanolamine acetate has been studied. The composition of the novel chlorate containing defoliant possessing growth of ripening and opening cotton bolls has been recommended based on obtained results.*

Аннотация: *изучалась зависимость раствора, физико-химические свойства меняются из компонентов композиции в водной системе, включая кальций, магний хлораты, хлориды и моноэтаноламин ацетата. Композиции хлоратов, содержащих дефолиант, влияющий на рост, созревание и вскрытие коробочки хлопка, были рекомендованы на основе полученных результатов.*

Keywords: *defoliant, physiologically active substance, calcium, magnesium chlorate and chlorides, calcium-magnesium chlorate defoliant, acetic acid, mono-ethanol amine, mono- ethanolamine acetate, thermogravimetric and radiograph analysis.*

Ключевые слова: *дефолиант, физиологически активные вещества, хлорат и хлориды кальция, магния, хлората кальций-магниевого дефолианта, уксусной кислоты, моноэтаноламинов, ацетат моноэтаноламина, термогравиметрическим и рентгенофазовым анализом.*

Obtaining the chlorate containing preparates based on local raw material and increasing their affectivity, reducing “hardness” action on cotton and development based on them affectively, complex activity defoliants are actual issue of cotton.

Employees of the Institute of General and Inorganic Chemistry AS RUz developed technology for producing calcium-magnesium chlorate defoliant. This technology is based on the use as a raw material instead of import – “Bischofite”, hydrochloric acidic decomposition products of the local “dolomite”, to obtain a calcium, magnesium chloride, and processing them with sodium chlorate by conversion method in calcium-magnesium chlorate defoliant.

There are currently no comprehensive action drugs that are both effective defoliants, stimulants of physiological processes, accelerators full maturation and opening cotton bolls. Therefore, in order to increase defoliant-like activity new chlorate, calcium-magnesium defoliant and the acceleration full maturation and opening cotton bolls physicochemical study mutual influence of components are carried out in a complex aqueous system consisting of chlorates and chlorides of calcium, magnesium and physiologically active compounds – mono-ethanolamine acetate. It is known that combination chlorate containing defoliants with mono-ethanolamine acetate leads to increasing defoliant activity and reducing hardness of their action on plant [1, 93-103].

In order to physico-chemical study of the process of obtaining a new more effective preparation of local raw materials having a high defoliant-like activity and a “soft” effect on cotton is based on chlorate, calcium-magnesium defoliant and mono-ethanol ammonium acetate studied dependence of physico-chemical properties of the solutions of the composition of the components of the system $[22.52\%Ca(ClO_3)_2+17.51\%Mg(ClO_3)_2+4.33\%CaCl_2+3.12MgCl_2+52.52\%H_2O]$-$CH_3COOH{\cdot}NH_2C_2H_4OH$. To determine the influence of components on the physicochemical properties of the above defined system solutions change crystallization temperature, pH, refractive index, density and viscosity of the composition solution. Based on these results the diagram of “composition-property” of the system has been drawn. According to the data chart “composition-temperature crystallization” of the system is characterized by the presence of two branches of crystallization, with a clear break in the curve solubility. The first branch corresponds to crystallization $[47.3\%Ca(ClO_3)_2+36.88\%Mg(ClO_3)_2+9.12\%CaCl_2+6.57\%MgCl_2]$ and continues until 2% content of mono-ethanolamine acetate at 3.8°C. With increasing concentrations of mono-ethanolamine acetate more than 2% in the system crystallized compound composition $CaOHClO_3{\cdot}NH_2C_2H_4OH{\cdot}2H_2O$. Analysis of the diagram “composition-pH” shows that as adding mono-ethanolamine acetate the value of pH solutions gradually increases. In the double point of pH value is 4.30. Further, with an increase in concentration of mono-ethanol ammonium acetate more than 2% i.e. compounds in crystallization field, the pH formed solution increases from 4.30 to 4.47. The diagram “part of the refractive index” is also characterized by the presence of the two branches of the crystallization with a break in the curve (Fig. 1, curve 3). Viscosity solutions studied system is gradually

increased from 6.69 mm^2/s and reaches 7.28 mm^2/s at a double point, i.e. with 2% of mono-ethanolamine acetate. With increasing concentrations of mono-ethanolamine acetate viscosity newly formed solution increases and reaches 7.59 mm^2/s, which is explained the change in the area of the crystallization system. Analysis of the diagram "composition-density" system shows that increasing concentrations of mono-ethanolamine acetate density of the newly formed solution decreases. On curve density diagrams of "composition-property", there is also a break. Branches of crystallization amounts of calcium, magnesium chlorates and calcium and magnesium chloride correspond to solutions density 1.511÷1.451 g/sm^3. The density values of the solution were 1.475÷1.451 g/sm^3 match crystallization branch connection $CaOHClO_3 \cdot NH_2C_2H_4OH \cdot 2H_2O$.

Compounds formed in the studied system, isolated in crystalline form and identified by chemical, X-ray and thermal methods of analysis.

Based on the results of study of "composition-properties" of the above mentioned systems and carried out agrochemical testing defoliant compositions implies that for an effective "soft" effect of the preparation, which has defoliant –like and physiological activity to be dissolved in a solution of chlorate of calcium-magnesium defoliant acetate mono-ethanol ammonium at a weight ratio of 1.0:0.0035. There has been formed that solution defoliant with good physico-chemical properties, having a crystallization temperature of 9.4 °C, viscosity of 6.79 mm^2/s, density of 1.502 g/sm^3 and pH of 4.07.

References

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