WEB OF SYNERGY:
International Interdisciplinary Research Journal
Volume 2 Issue 4, Year 2023 ISSN: 2835-3013
https://univerpubl.com/index.php/synergy

Application of Modified E-466 - Composite Silver-Ion Grades in Several Fields of Food Chemistry

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Article Information

Received: February 18,2023
Accepted: March 19,2023
Published: April 18,2023

Keywords: *Banana cellulose, extraction process, amount of main substance, cotton lint, degree of polymerization, pentosan, alkali coagulation, swelling, ash content, moisture, cellulose, concentration, parometer, optimal conditions, destruction*

ABSTRACT

During the synthesis of E-466, obtained on the basis of local raw materials, modified - composite silver ion brands, application research was carried out in several existing branches of household chemistry and positive results were achieved. In particular, this research work was carried out to achieve ecological purity, to simplify the composition of laundry detergents as harmless as possible, even if partially free from various carcinogenic consequences, and to exchange them with local reagents.

Introduction

Universal - suitable for washing various gauze and woolen products, washing machine and hand washing. They also remove various dirt, stains and small stains from the fabric. Detergents with the name "bio" on the label are considered slightly stronger and are less effective at removing sauce, coffee, tea, fruit and grease stains.

Special - in liquid form, used only for washing woolen or colored fabrics in low temperature water. It can also be designed for a washing machine (automatic machine).

"Avtomat" - has special bleaching agents, but the foaming property is lower compared to other types, and is mainly intended for washing machines. It is better not to wash bright colored thin silk fabrics and cotton gauze in this powder.

In the case of powders recommended to be washed in cold water, it is possible to wash synthetic and thick fabrics without the water temperature exceeding 60 degrees. If you can be washed in a washing machine, then it is not necessary to heat the water.

Bio supplements are enzymes that are natural. They have the ability to dissolve various stains, eliminate complications from food and drink.

All things can be washed using rubber gloves, except for natural silk, wool, and other natural fiber fabrics with powder and bio additives.

Otherwise, this powder causes diseases such as dryness and peeling of the hands, allergic reactions.

Processes for studying the composition of composite mixtures in household detergents and researching cellulose esters for this composition. A quality detergent is considered a guarantee of cleanliness. The laundry detergent should satisfy the smell and quality of the fabric being washed. Due to the carelessness of the user, sometimes it can affect the washing machine and sometimes it can affect the health of the person washing it. Many people have not yet developed the choice of washing powder types. In universal powders, you can wash any type of cotton and wool products, both in a washing machine and by hand. They also remove various dirt, stains and small stains from the fabric. Therefore, the name "universal" is indicated on the container of powders, which stand one step higher than other types. Detergents with the name "bio" on the label are considered slightly stronger and are less effective at removing sauce, coffee, tea, fruit and grease stains. "Avtomat" - this type, which has special bleaching agents, but has lower foaming properties compared to other types, is mainly intended for washing machines. It is better not to wash bright colored thin silk fabrics and cotton gauze in this powder. You can wash synthetic and thick gauze in powders that are recommended to be washed in cold water. It is not necessary to heat the water if you want to wash it in the washing machine. In the packing box of such laundry detergents, it is stated that the water temperature should not exceed 60 degrees. Bio additives are natural enzymes. Enzymes, in turn, have the ability to dissolve various stains, eliminate complications caused by food and drinks. Bio-additives are effective at 60 degrees, and at higher temperatures, they decompose. With powder and bio additives, you can wash everything except natural silk, wool, as well as fabrics made of other natural fibers. The more complex the composition of the washing powder, the more complicated it is to know its effect on human health. In most cases, the harmful chemicals contained in the tool remain on the surface of the container, enter the human body with food and cause a number of serious diseases. Means for washing dishes are called Surface active agents (SAAs) in the language of chemists, and they are divided into cationic surface-active agents (CaSAAs), anionic surface-active agents (AnSAAs), amphoteric surface-active agents (AmSAAs), non-ionogenic agents (N-ionSAAs). It is very difficult to wash off these chemical compounds from the surface of the container.

When dishes are washed with dishwashing gel, there are dissolved SAAs in the water droplets. When the water dries, these substances cover the surface of the container. When hot food is put in the dish, SAAs are added to our food and enter the body together with the liver.

Most of the population of the world suffers from various allergic diseases. Many explain this by the deterioration of the environmental situation, 70 percent do not know that allergic and other diseases are the result of using chemical dishwashing detergents in the kitchen. Often, the onset of diseases is manifested as an allergic reaction, and ends with cancer of the gastrointestinal tract, hypertension, depression. Chlorine is the safest for nature among the chemicals listed above. It breaks down into safe components in nature. Chlorine and its organic compounds have a negative effect on humans, causing cardiovascular diseases, atherosclerosis, anemia, and hypertension. The active substances of the surface are carcinogenic. They absorb the protective layer of the stomach. The compounds are absorbed into the blood and gradually poison the whole organism. Not only the active ingredients, but also the fragrances and preservatives included in the dishwashing detergent have a negative effect on the human body. Wastewater containing dishwashing detergent also causes great damage to the environment. When the wastewater enters the water body, it leads to their swamping, which causes the death of animals and plants. If the dishwashing detergent contains anionic SAAs, they are practically non-degradable and cause three times more damage to the human body and the environment than

others. Today, a number of foreign countries have strict requirements for chemical detergents. For example, in the European Union, in accordance with EU Regulation No. 259/2012, it is necessary to provide complete information about the product and its composition on the labels of dishwashing detergents. In addition, individual ingredients should be listed regardless of their concentration. For example, fragrances. The Technical Regulations adopted in Russia in 2010 do not oblige to list the composition of detergents in full. Manufacturers who use it effectively, in most cases, "forget" the most toxic and poisonous substances. In the United States, the sale of soaps and shower gels together with chemical dishwashing detergents with the inscription "antibacterial" is about to be banned. Many years of research have found 19 components in their composition that are dangerous for human health. The most important of them are triclocarban and triclosan, until now these substances were considered to kill viral and other disease-causing microorganisms. Antimicrobial triclosan has recently been shown to cause liver cirrhosis and fibrosis. According to Janet Woodcock, head of the expert center, the negative effects of triclosan on human health have been fully established. First of all, the washing agent must be safe for human health.

Taking into account the above-mentioned practical events and the negative consequences arising from them, this research work was carried out to simplify the composition of laundry detergents as harmless as possible, free from various carcinogenic effects, and to exchange them through local reagents, to achieve ecological purity - in-depth analysis done Below is a composite composition of washing powder obtained on the basis of local raw materials, according to which a brand of drug E-466 with a high exchange rate and high basic substance content and high viscosity was used in the composition of the composite:

Consumption norm of reagents related to washing powder based on available and proposed composition in production

Table-1

	Chemical reagents	Available content, reagent consumption rate, kg	Consumption norm of the proposed content, kg
	Na_2CO_3	20,2	28,8
	Na_2SO_4	12,2	8,4
	Na_2PO_4	4,6	4,2
	LAS-80	7,25	5,4
	Na_2SiO_3	1,8	-
	NaCl	0,5	-
	Na-КМЦ	0,450	0,280 (E-466)
	H_2O	2,6	2,4
	Glycerin	1,4	0,5
	Total	50,0	50,0

It can be seen from the table that due to the sharp reduction of consumption rates of the existing composition in production, and by adding the innovative product - E-466 to the new composition, it became known that I achieved a positive result in the transparent and opaque color of the clothes being washed under its influence. That is, aqueous solutions of simple ether of cellulose (Na-CMC (Carboxymethylcellulose), E-466) are able to significantly increase the viscosity (viscosity) of latexes and various oils. The addition of up to 25% Na-CMC, E-466, a simple cellulose ether, improves the cleaning effect of the corresponding detergents so much that

it is equivalent to natural soap. The inclusion of the synthesized innovative product E-466 in the composition based on strictly defined consumption norms gave the above positive conclusions.

Research of silver ion E-466 as a stabilizing reagent of laundry powder composition and its role in composite composition

Antibacterial, disinfecting washing powders are used both for washing clothes and at home. Instead of harsh chemicals, silver ion laundry detergent is a safe and highly effective antibacterial detergent. The neutralizing effect of silver ions and its beneficial properties have been scientifically proven for a long time, that is, the bactericidal, anti-viral, anti-fungal, and disinfecting properties of silver ions are incomparable.

A small concentration of silver ions in washing powder is also able to destroy various harmful cell membranes.

The advantages of silver ion laundry detergent are as follows: the disinfecting effect of silver is 3.5 times higher than that of sodium hydrochloride, silver does not form toxic compounds and does not have an odor. Silver ions have an effect on more than 350 types of bacteria.

Research on the use of modified silver ion E-466 brands in the composition of the laundry powder composite to fight against various bacteria and viruses and offer positive results.

Taking into account the above, it was recommended to produce an innovative composite product of washing powder with a new composition and consumption rate during the dissertation research. The difference between this composition and the existing analgar is that silver ions were initially synthesized on the basis of local raw materials, that is, as a result of the interaction of silver particles with mineral acid - HNO_3. The silver ion in the obtained acid medium was neutralized using special filters, dried and included in the composite composition during the synthesis of Na-CMC.

Silver is resistant to acid. Chloride, diluted sulfuric acid and "tsarskaya vodka" do not affect it, because a protective film of silver chloride (AgCl) has formed on the surface of the metal. Silver dissolves well in nitric acid and soluble sodium nitrate ($AgNO_3$) is formed:

$$\mathbf{Ag + 2HNO_3 = AgNO_3 + NO_2 + H_2O}$$

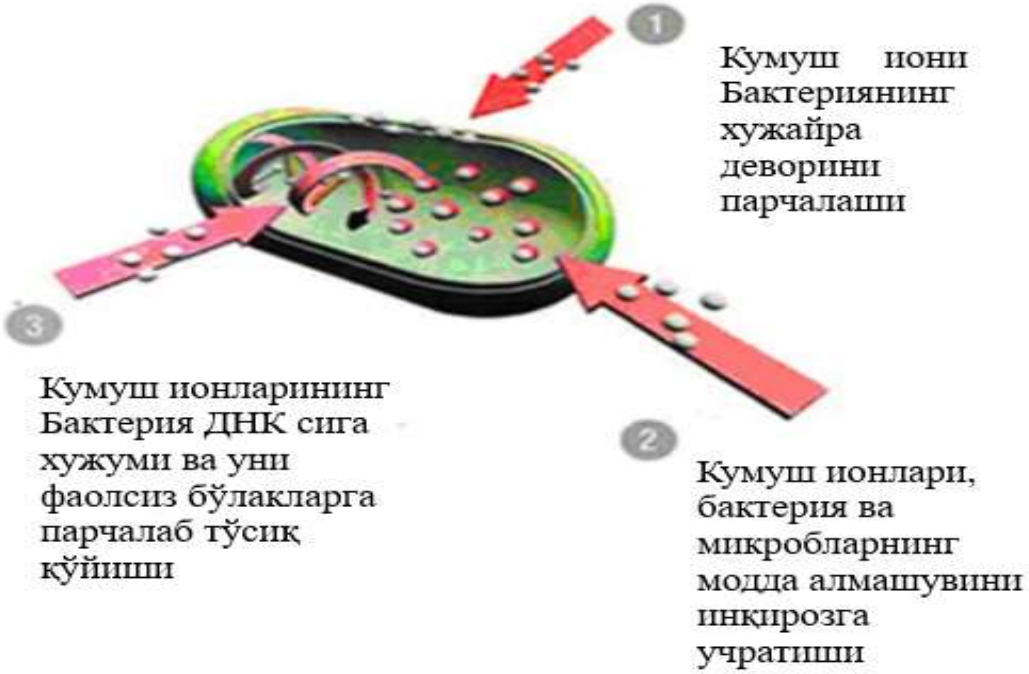
Hot concentrated sulfuric acid dissolves silver to form silver sulfate ($Ag2SO_4$). The solubility of silver sulfate in water at 20°C is 0.79% by weight.

A clear bactericidal effect of silver ions above 150 micro g/l is observed, that is, the ability to clearly kill certain bacteria. At a concentration of 50-100 micro g/l, silver ions have a bactericidal effect, that is, the ability to block the growth and reproduction of bacteria. It should be noted that bacteriostatic is a reversible process and growth and reproduction can occur after the end of the influencing factor. Only cases of long-term bacteriostatic effect are excluded. The main conclusion is that silver in the concentrations allowed by the current standards - 50 micro g/l of water according to Sanitary Rules and Standards (SanPin) - has the best bacteriostatic effect, that is, it can dramatically slow down the growth of bacteria.

In the dissertation study, the consumption of E-466 and silver ion contained in the laundry powder with the new consumption norm was determined as a result of many repeated imaging studies and recommended for production. Adding silver ion to the synthesis period of Na-CMC in the localization process after the mercerization process, adding it in the consumption rate specified in the compositing, and in the process of exchange with various reagents and functional groups, direct participation in the level of exchange of cellulose hydro alkoxide groups, and as a result of extraction with ethyl alcohol, E-466 is considered an innovative product. It was used as the main raw material in the synthesis of several brands of the drug - an organic substance with

an important composite composition and in the synthesis of several types of products based on it.

Below is how silver ion activity works:



In conclusion, it can be noted that during the synthesis of E-466 obtained on the basis of local raw materials, modified - composite silver ion brands were used in several branches of household chemistry and positive results were achieved. In particular, this research work was carried out to achieve ecological purity, to simplify the composition of laundry detergents as harmless as possible, even if partially free from various carcinogenic consequences, and to exchange them with local reagents. Below, a composite composition of washing powder obtained on the basis of local raw materials was developed, according to which, in the composition of the composite, a brand of drug E-466 with a high degree of exchangeability and a high content of the main substance and a high viscosity was used. On the basis of these, a separate content was created and presented for implementation, according to the consumption norm of reagents for washing powder, based on the existing and proposed content.

In this chapter, the research of silver ion E-466 as a reagent for stabilizing the composition of washing powder and its role in the composition of the composite was carried out, and significant positive results were obtained by introducing silver ions into the synthesized E-466 preparation on the basis of composite modification. It is known that antibacterial, disinfecting washing powders are used both for washing clothes and at home. Instead of harsh substances, silver ion washing powder is a safe and highly effective antibacterial detergent. The neutralizing effect of silver ions and its beneficial properties have been scientifically proven for a long time, that is, the bactericidal, anti-viral, anti-fungal, and disinfecting properties of silver ions are incomparable.

It is important to note that Bacteriostasis is a reversible process and growth and reproduction can occur after the elimination of the influencing factor. Only cases of long-term bacteriostatic effect are excluded. The main conclusion is that at the concentrations allowed

by the current standards - 50 micro g/l of water according to Sanitary Rules and Standards, silver has the best bacteriostatic effect, which means that it can dramatically slow down the growth of bacteria.

In the dissertation study, the consumption of E-466 and silver ion contained in the laundry powder with the new consumption norm was determined as a result of many repeated imaging studies and recommended for production. Adding silver ion to the Na-CMC synthesis period in the localization process after the mercerization process in the specified rate of compositing, as well as the direct participation in the exchange process with various reagents and functional groups in the hydro alkoxide groups of cellulose during the exchange process, and the preparation E-466, which is an innovative product, as a result of extraction using ethyl alcohol it was used as the main raw material in the synthesis of several brands - an organic substance with an important composite composition and several types of products based on it.

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