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Synthetic Detergents and Cleaning Products in the CIS and Baltic Countries: Production, Market and Forecast

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Annotation

The report is devoted to investigation of current standing of the market of synthetic detergents and cleaning products in the CIS countries and Baltic states and forecast of its development for the period up to 2020. The report consists of 7 chapters, contains 152 pages, including 33 Figures, 50 Tables and 2 Appendices.

This work is a desk study. As information sources, we used data of the Federal State Statistics Service of the Russian Federation (Rosstat), State Statistics Service of Ukraine, the Statistics Agency of the Republic of Kazakhstan, the Statistical Committee of the CIS and the Baltic states, Eurostat, the customs statistics of the Russian Federation, Ukraine, the United Nations, railway statistics on the Russian Federation, as well as the materials of the sectoral and regional press, and web-sites of relevant companies-producers. In addition, telephone interviews were conducted with representatives of the major manufacturers, the results of which are also presented in the study.

The introduction and the first chapter of the report provide an overview of detergents and cleaning products, and the classification of synthetic detergents.

The second chapter gives a brief description of the manufacturing technology of the products in question: formulations, technological schemes of production of powdered and liquid synthetic detergents, as well as the data on raw materials used and the largest suppliers of basic raw materials.

The third chapter is devoted to analysis of the production of detergents and cleaning products in the CIS countries and the Baltic States, broken down by powdered and liquid products. It presents data on volumes of production in 1996-2011 (for all countries) and the 1st half of 2012 (for the Russian Federation, Ukraine, and Kazakhstan), the structure of production, the current state of the major manufacturers.

The fourth chapter of the report analyzes foreign trade operations with cleaning products and detergents in the CIS countries and Baltic states in 2007-2011 (for all countries) and the 1st half of 2012 (for the Russian Federation and Ukraine). It provides statistics on the volume of foreign trade, the regional structure of exports and imports of products.

The fifth chapter provides a price analysis of the market of cleaning products and detergents. The dynamics of prices of manufacturers in the domestic market of the Russian Federation (in 1998-2011 and the 1st half of 2012) and Kazakhstan (2005-2011) is given, as well as export and import prices in other countries of the CIS and the Baltic states.

The sixth chapter is devoted to the analysis of consumption of detergents and cleaning products in the CIS countries and the Baltic states, broken down into powders and liquid detergents. This chapter presents the balance of supply and consumption of the product in all countries, and estimates the structure of consumption.

The seventh, final chapter of the report presents a forecast of development of the market of cleaning products and detergents in these countries for the period up to 2020.

Appendices present a brief description of the major manufacturers of synthetic detergents, as well as their contact information.

Introduction

Cleaning agents traditionally include synthetic detergents and soap, as well as materials to supplement their action: bleaches, conditioners, washing salts, restorers of color, soaking materials, and stain removers. The main purpose of detergents is the cleaning of objects, surfaces, fabrics and articles made of textile and non-woven fabrics from pollutions of different nature.

Synthetic detergents are multicomponent compositions and they may be *liquid, paste-like and powdery*. They comprise surface active agents (surfactants) and other organic and inorganic substances which increase the efficiency of the surfactants.

First detergents were soaps, derived from naturally occurring substances. However, fatty soaps have some drawbacks. Their detergent effect is manifested only in an alkaline medium; with calcium and magnesium salts, contained in hard water, they form insoluble salts, which deposit on the fabrics and contaminate them. Alkali compounds, contained in the soap, weaken the strength of wool and silk fabrics, and fabrics made of polyester fibers, especially at elevated temperatures, and may also discolour fabrics. In addition, fatty raw materials for soaps are valuable food products, which are in a low supply. All this leads to the relevance of the production and use of synthetic detergents, which have the following advantages:

1. Production of synthetic detergents is based on a cheap raw material base - the products of processing of petroleum and gas. The calculations show that the cost of production of synthetic detergents is not more than 65-70% of the cost of production of the 47% common soap. Implementation of a broad program for the production of detergents allows to free up a large amount of a dietary fat.

2. Synthetic detergents do not interact with the salts of hard water or the reaction yields products, which are easily removed from the fabric. Many synthetic detergents equally well clean in soft and hard water, and some even in seawater.

3. Synthetic detergents, depending on their composition, can wash well fabrics not only in an alkaline environment, but also in the neutral and acidic media.

4. Synthetic detergents exhibit the cleaning action not only in hot water but also in water at relatively low temperatures, which is very important when washing products made of chemical fibers, etc.

In turn, synthetic detergents have a number of inherent shortcomings: a not always sufficient detergency action; a lower foam stability; a difficult bioavailability; they cause a dry skin of hands when washing.

The first synthetic detergents were created in Germany during the first World War, due to a large deficit of dietary fat, and after the war the synthetic detergents industry flourished in the United States, Japan and some European countries. In this case, the development of the world detergent industry was strongly influenced by the limiting factors, such as the availability of raw materials. In different countries, synthetic detergents were produced from various raw materials. For example, in the United States sodium oleyl taurate began to be actively used, Germany - aliphatic sulfates (sulfates of fatty alcohols), in the United Kingdom - a secondary olefine

sulfate, derived from petrochemical sources, which is released in England in large quantities.

Thus, synthetic detergents finally were established on the market. So, in the years 1940-1972 the demand for synthetic detergents in the United States increased 1000-fold to 4.5 million tons per year, the demand for soap fell by almost a factor of 3, which was associated with an increase in the use of washing machines.

Production of detergents in the world was developed due to both a displacement of fatty soaps, and due to the increase of the total consumption of detergents. Currently, the world production of synthetic detergents amounts to tens of millions of tons per year. However, most of them (70%) is consumed only by residents of the most developed countries, constituting about 20% of the population. About 70% of detergents, consumed by the population, are spent on the so-called common laundry (in the U.S. and the UK it is called "heavy"), which is done once in 3-7 days. This wash, where bedding, table linen and underwear are washed, is carried out most frequently in washing machines. About 20% of synthetic detergents is spent on a "light" wash of less-polluted products from fine fabrics by hand in warm water.

The most widely used are detergents in a powdered form, in particular those for domestic use. During the last decade, the release of liquid detergents increased significantly, mainly for industrial applications. This is due to the fact that during the use and storage of detergents in liquid form their drying is excluded, liquid compositions do not give up dust, they are easily dispensed, can be quickly and easily mixed with water. In addition, liquid detergents can be conveniently transported in rail tank cars, tank trucks and drums.

Currently, synthetic detergents are used for washing textiles, cleaning household items, vehicles and equipment. In addition, in the industry they facilitate technological processes in the bleaching and dyeing of fabrics, furs and skins.

A range of **cleaning agents** includes cleaners for dishwashing, cleaners for bathrooms, toilets, glass, household and specialty cleaners.

Note that the classification into detergents and cleaners is often very arbitrary. In general, the market of household chemicals includes the following household hygiene assets:

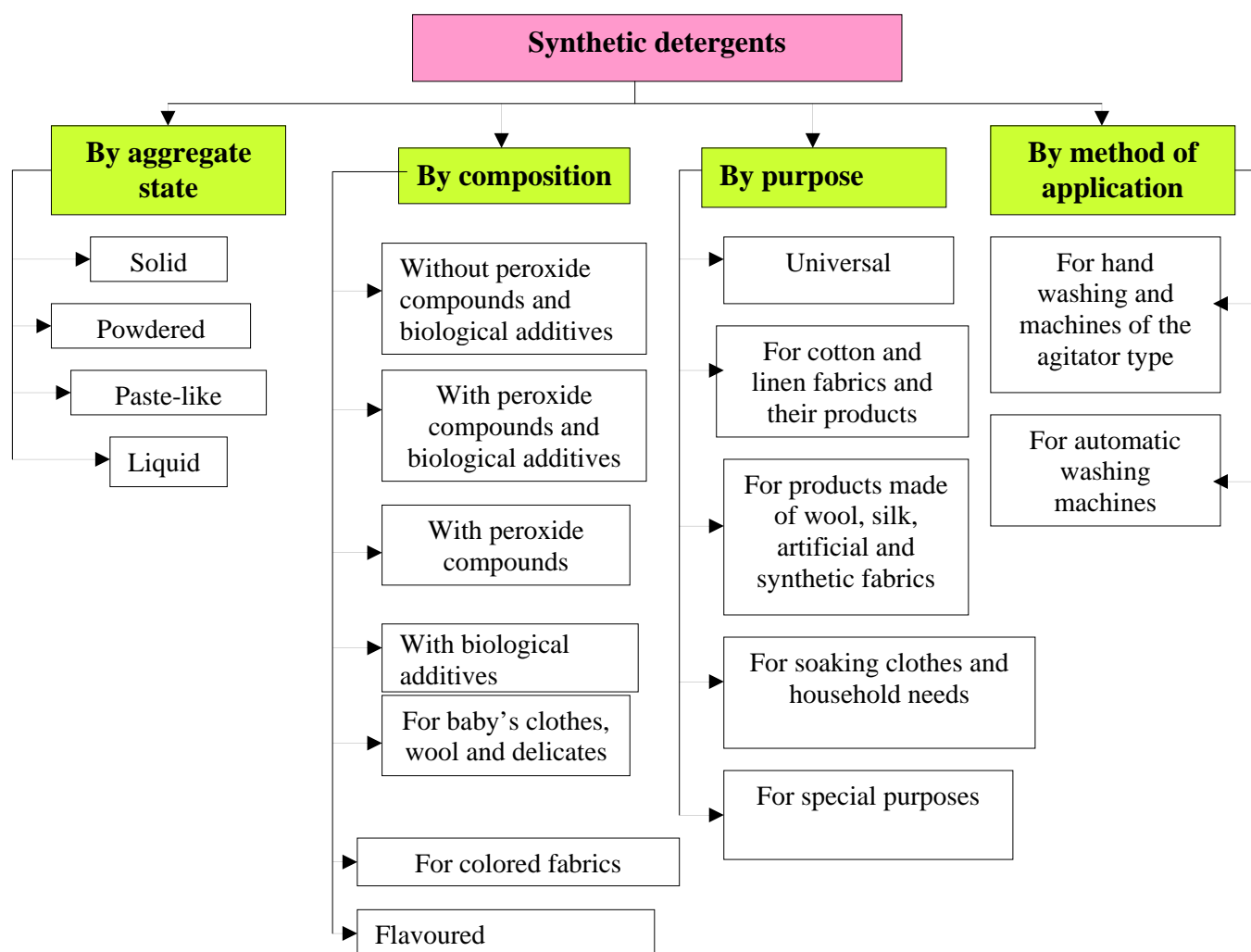
- Means for laundry care (synthetic detergents);
- Means for home care (detergents and cleaners for various purposes - for washing dishes, floors, toilets, carpets, windows, bleaches, multi-purpose agents, etc.).

1. Classification of synthetic detergents

According to the Russian Classification of Production, "Synthetic detergents" belong to a subgroup 238110 and are divided into 5 types: 238111 - universal; 238112 - for cotton, linen fabrics and articles thereof; 238113 - for products of silk, wool, artificial and synthetic fabrics; 238114 - for soaking clothes and household needs; 238116 - for special purposes.

In addition, synthetic detergents are classified by the aggregate state (consistency), the composition and method of application (Figure 1).

Figure 1. Classification of synthetic detergents



Source: "InfoMine" based on the review of the technical literature

By the aggregate state (consistency) solid, powdered (granular), liquid and paste-like synthetic detergents are distinguished. The worldwide production of powdered agents exceeds 80% of the total release of synthetic detergents. Those are the most concentrated agents. They are suitable for administration to the supporting components and for packaging. By the composition they are usually a mixture of

anion-active (for washing and soaking of articles of cotton and linen), nonionic (for synthetic fabrics) surfactants and auxiliary components. However, powdered synthetic detergents are often potent allergens, and traditional surfactants used in them, have the ability to accumulate.

Solid (lump) cleaners work well for washing in conditions of scarce water resources, recreation, travel, tourism and everyday life, as they allow an efficient processing of washed items. Washing by hand a small amount of product in a small volume of cleaning solution is still relevant, despite the rapid increase in production of washing machines and improving their designs. For hand washing exceptionally effective are synthetic detergents in a lump form. Solid detergents can be released as tablets. Such agents are convenient and easily dosed; there is no allergic reactions to them.

Production of *liquid* detergents uses less energy and it is simpler, because they do not require drying. Liquid detergents do not cause allergic reactions, and more economical in dosing. The fact that their production is not sufficiently developed, can be explained only by the lack of an effective cleaning action for all kinds of fabrics, because they do not contain chemical bleaches, alkali metal salts, enzymes, and therefore exhibit detergency only in soft water and mainly for wool and silk. Furthermore, the small demand for liquid detergents in our country may be explained by the unfamiliarity of consumer with benefits, whereas in the U.S. liquid detergents amount to over 40% of corresponding products and are in high demand. This, among other things, is due to the tradition of washing, water hardness, the energy-efficiency of washing machines, which ensure proper washing in small volumes of water at lower temperatures. The innovations are liquid detergents with a high viscosity - gels. In the liquid and gel form are often manufactured detergents for dishes, glasses, utensils, equipment, etc.

Paste-like compositions contain up to 40% of water. Their composition can include almost all supplements, except unstable chemical bleaches.

By composition, there are synthetic detergents without peroxide compounds and biological additives, with peroxide compounds, with peroxide compounds and biological additives, for wool, fine fabrics and baby clothes, for colored fabrics (the name of such agents include the designation "Color"), and their use requires special temperature conditions. They include polymer additives to prevent the transfer of dyes from the fabric in a solution, and flavoring compounds (usually indicated on the package, what smell they give to the garment).

By purpose there are five groups of detergents. Agents for the *washing of articles made of cotton and linen fabrics* contain up to 25% of surfactants, up to 20% of alkaline electrolytes, up to 35% of polyphosphates, alkylolamides, carboxymethyl cellulose, and sometimes bleaches. These agents should not be used for washing wool products as a high alkalinity (pH - 10-11.5) destroys the protein substance keratin, from which fibers of wool fabrics are composed.

Detergents for the washing of *articles of wool, silk and synthetic fabrics* do not contain sodium perborate and create a softer environment (pH of 8.0-9.5).

The universality of synthetic detergents of the next group is provided by their composition and differentiated terms of washing. The presence of alkaline salts in such compositions (pH - 9-10) has no negative effect on products from the protein and synthetic fibers, as at 30-40°C the activity of the alkaline substance is low. Products made of cotton and linen fabrics are washed using universal detergents at a higher temperature (60-80°C).

Synthetic detergents *of special purposes* are mainly professional cleaning agents (for disinfection, decontamination of surfaces and washing of clothes, the washing of shorn wool, for laundries, to remove the Scotch tape, and so on).

Liquid detergents are divided into detergents for washing products made of wool, silk, synthetic and artificial fabrics in cold and warm water, and universal detergents. Paste-like detergents are designed for washing products from cotton and linen fabrics, of wool and delicates in cold and warm water, for washing and coloring of products of all kinds of fabrics, for strongly polluted products made of cotton, lined and blended fabrics (with low foaming), and for washing of heavily soiled clothes.

Approximately 45% of all synthetic detergents for the household use are universal detergents, the same amount is represented by agents for cotton and linen fabrics, and only 10% of output is accounted for by detergents, used for the washing of articles from wool, silk and chemical fibers. Recently, there has been a tendency to increase the production of synthetic detergents of *integrated or combined action*, which include detergents and agents for simultaneous starching, disinfecting, and anti-static treatment of products. To provide disinfecting properties, detergents of the combined action include acid-resistant aldehydes, and salts of quaternary ammonium, phosphonium or arsonium.

By the method of application (the washing method) the following detergents are distinguished: with high (nonspecified) foaming (for hand washing and washing machines of the agitator type) and with reduced foaming (for washing in automatic and semi-automatic washing machines).

Among agents, enhancing the action of detergents, we note bleaches, conditioners, anti-static agents, etc.

90% of the total release of **bleaches** is accounted for *chlorinated* bleaches (Belizna, ACE, Domestos, etc.) due to their low cost and versatility. They have a disinfectant effect and can be used as detergents for a dishwashing and sanitary equipment. Being incompatible with optical brighteners, chlorine-containing agents are used only for cotton and linen fabrics.

Modern bleaches have lower concentrations of an active chlorine, may be used at lower temperatures and with a short time of bleaching. For reasons of hygiene, to reduce the residual chlorine on the fabric, it is suggested to bleach products before washing.

Oxygen-containing whiteners have as a bleaching agent peroxoborate (Vanish, Lebed, etc.) or sodium peroxyhydrate carbonate (Persol, Tadoks, etc.). Peroxoborate of sodium has the best properties. It is stable during storage, it almost does not

destroy fibers, it well removes stains. Oxygenated bleaches are designed for cotton and linen fabrics, as well as for viscose and synthetic fabrics.

The composition of liquid, the so-called soft bleaches (Perox, chlorine-free Belizna, liquid Vanish) comprises of an aqueous solution of hydrogen peroxide and the organic compounds, forming peroxy carboxylic acids and increasing the efficiency of bleaching. Such whitening agents are effective only in detergent solutions with pH=8-10.5.

Sulfur-containing bleaches (like Liliya) cause the least destruction of the fabrics and due to their compatibility with optical brighteners are used for all types of fibers, including wool. The disadvantages of bleaching agents in this group are a disagreeable odor and the ability to change the color of colored fabrics.

On the whole, the range of bleaching agents by the destination is represented by two groups - for the producta made of cotton and linen fabrics and universal bleaches.

Softeners (conditioners), making the fabric soft and velvety, are represented by liquids Help, Lenor, etc. The most in demand in the market are multi-functional means, which in addition to softening and providing a pleasant smell, contribute to improving the sliding of an iron, reduce creasing when washing, facilitate the smoothing of fabrics with iron, contribute to the color retention, protect against stains, help keep the shape of the product, and increase the absorbability of fabrics. Conditioners, which composition together with quaternary ammonium bases includes emulsions of silicone materials, satisfy these requirements.

Antistatic agents are used to reduce the static-charge accumulation on fabrics of synthetic fibers. They contain surfactants, which form a thin film on the fabric, retaining water, thus improving the electrical conductivity and decreasing the static characteristic of fibres. Antistatic agents may be added to the rinsing solution as a paste or be applied to the surface of the product in the form of aerosols.

Bluing agents are made on the basis of ultramarine and organic dyes. They are designed for bluing at the final rinse, for bluing during the wash, for bluing and starching.

The **stiffeners** make the fabric denser, provide hardness, attractive appearance, and a better ability to launder. Traditional stiffeners on the basis of starch give a one-time effect that disappears after washing. For long-term starching of mainly cotton fabrics agents based on polyvinyl acetate emulsion are used. The compositions can contain additives of carbamol (uncured urea resins): when curing, they impart a crease resistance of fabric.

Waterproofing agents (hydrophobic) contain a liquid silicone resin and are used to impregnate the fabric.

2. Technology of production of detergents, the resources used in the industry

2.1. The composition of the synthetic detergents, raw materials used in the industry

Synthetic detergents generally comprise micelle-forming surfactants, possessing detergent, wetting and antistatic effect, various electrolytes, complexing agents, additives to provide an anti-resorption action (prevents the redeposition of dirt particles), a perfume additive, masking the specific odor of compositions and flavoring fabrics, as well as various special additives: optical and peroxide bleaches, enzymes, stabilizers, activators, solvents, hydrotropes, corrosion inhibitors, preservatives, defoamers, dyes, pigments, antioxidants, fillers - binders (in lumpy synthetic detergents), and other compounds (Table 1).

Table 1. The main ingredients of detergents and their purpose

Ingredients	Purpose
<i>Basic compounds</i>	
Surfactants	Detergency action. Anionic surfactants perform better in an alkaline medium. Cationic surfactants are used also as corrosion inhibitors (to protect the washing machine), antistatic agents, emulsifiers; have a disinfecting effect.
<i>Auxiliary substances</i>	
Alkaline salts - sodium carbonate and sodium silicate	Slow down the corrosion of metal parts of washing machines, increase the anti-resorption capacity and reduce hygroscopic properties of powder detergents.
Neutral salts - sodium sulfate and phosphate	Improve the flowability of a powder and its solubility in water, increased the detergency action. Phosphate salts are used to reduce the alkalinity of the detergent solution to pH = 7. Polyphosphates eliminate plaque on fabrics formed by poorly soluble compounds, reduce the ash content of fartics.
Carboxymethyl cellulose	Prevents the resorption of dirt in the compositions of synthetic detergents for linen and cotton fabrics.
Polyvinylpyrrolidone	Prevents the resorption of dirt in the compositions of synthetic detergents for wool and silk fabrics.
Chemical bleaches (persalts)	Whiten cotton and inen fabrics. When heated, release the atomic oxygen.
Chemical bleaches (oxygen peroxide)	Whiten wool and silk fabrics.
Physical (optical) whiteners - fluorescent compounds	Give the effect of whiteness by converting the incident light and its reflection from the fabric in the blue region of the spectrum.
Adsorption dyes (ultramarine, indigo, synthetic organic pigments)	The action is based on an optical effect - the adsorption on the surface of the fabric without a chemical action. The fabric obtains brightness of blue or pink hues.
Bioadditives - enzymes (lipases, proteases, etc.)	Remove dirt and grease stains (lipids) and protein substances: traces of blood, etc.
Perfume additives	Aromatize the fabric
Antistatic agents	Discharge the static electricity

Source: "InfoMine" based on the review of the technical literature

Thus, the main components are synthetic detergents, represented by anionic (about 70% of the total use of surfactants), cationic, amphoteric or ampholytic (developed recently, so far very expensive and not widely used) and nonionic **surfactants**. Modern detergents use surfactants which have a degree of biodegradation of at least 90%. The most used *anionic surfactants* are:

- Alkyl sulfates $R\text{-OSO}_3\text{Na}$ - sodium salts of sulfuric esters of higher fatty alcohols (R-alkyl $C_{11}\text{-}C_{17}$). They are obtained by sulfation of fatty alcohols, followed by neutralization of the obtained product. Sulphates of ethoxylated fatty alcohols have a high cleaning effect and 100% biodegradable. Alkyl sulfates depending on the molecular structure are divided into primary (processed natural fatty acids) and secondary (petroleum processing products).

- Alkylsulfonates (alkanesulfonates) $R\text{-SO}_2\text{ONa}$ are salts of fatty sulfonic acid (R-alkyl $C_{12}\text{-}C_{18}$), derived from paraffinic petroleum hydrocarbons. They have high detergency and biodegradable to 99%. Alkyl sulfonates are preferably used in a mixture with other cleaning agents, as they have less detergency than alkyl sulfates.

- Alkylarylsulfonates are sodium salts of alkylarylsulfonic acids obtained by sulfonation of alkylated benzene. The raw material for them are the kerosene fractions of crude oil. In our country, alkylarylsulfonates are produced mainly in the form of alkyl benzene sulfonates (sulfonols). A major disadvantage of all benzene derivatives of detergents is their hard bioavailability. However, over half of all synthetic detergents are manufactured on the basis of alkylarylsulfonates.

- Olefin and hydroxy-olefinsulfonates (R-alkyl $C_{10}\text{-}C_{14}$) have good detergency, including in hard water, which is especially important for phosphate-free detergents.

From *cationic surfactants* the practical application have compounds of quaternary ammonium with different functional groups in the hydrophobic chain. *Nonionic surfactants* (ethoxylated alcohols, ethoxylated alkylphenols and alkylamines) regulate foaming and destroy the surface tension of water.

In the formulation of synthetic detergents a combination of 2-3 surfactants-synergetics is often used, differing in solubility, resistance to salts of hardness, and the detergent efficiency against solid, fat and protein contaminants. The number of surfactants of various types in synthetic detergents reaches 35% by weight (Table 2).

Table 2. The composition of synthetic detergents, %

Material	For cotton with whitening	For synthetic fabrics	For wool and silk fabrics	For soaking and pre-washing
Surfactant	20-18	25	35	15
Sodium tripolyphosphate	35-40	50	5	40
Sodium perborate	10-20	-	-	-
Sodium silicate	5-7	5	-	-
Soda	15-20	-	-	-
Carboxymethyl cellulose	0,9-1	-	-	1,0
Optical brightener	0,1-0,2	0,4	0,2-0,3	-
The stabilizer of peroxide salts	1-2	-	-	-
Sodium toluene sulfonate	0-2	0-2	-	-
Sodium sulfate	Up to 10	Up to 8	Up to 55	Up to 25

Perfumes	0,1-0,3	0,1-0,3	0,1-0,3	-
Enzymes	-	-	-	3-5
Moisture	Up to 10	Up to 10	Up to 5	Up to 10

Source: "InfoMine" based on the review of the technical literature

Virtually all powder detergents contain mineral salts, of which **phosphates** are most widely used: sodium tripolyphosphate, trisodium phosphate, tetrapotassium pyrophosphate, and others, capable of forming complexes with polyvalent cations. Liquid formulations preferably use trisodium phosphate, chlorinated sodium tripolyphosphate and trisodium phosphate (in disinfectant detergents for dishes), in enzyme-containing detergents small amounts of Ca or Mg salts are used. Fully or partly the functions of phosphates may be performed by chelators - sodium salts of nitrilotriacetic acid (Trilon A) and ethylenediaminetetraacetic acid (Trilon B), salts of ethylenediphosphonic and citric acids, and also zeolites. The use of effective substitutes for phosphates in synthetic detergents is very important in connection with the pollution of water bodies with nutrients. The number of complexing agents in synthetic detergents reaches 40% by weight.

Peroxide whiteners (for example, sodium peroxoborate or sodium percarbonate and perborate) are introduced only in powdered detergents in an amount of 10-20%.

Synthetic detergents by 15-20% consist of **soda ash**, which is a water softener, and used for the grease removal and as a cleaning agent. Proportions of the remaining components do not exceed 10% by weight.

Liquid detergents may in addition contain 10-15% by weight of organic solvents (lower alcohols, glycols, esters, alkanolamines) and hydrotropes which reduce the cloud point of solutions and improve the compatibility of components.

Dishwashing liquids for washing dishes have approximately the same composition as the synthetic laundry detergents; but to them stricter hygiene requirements are applied - no toxic and irritating actions. Agents for the automatic dishwashing contain, as a rule, low-foaming nonionic surfactants with high degreasing power and, together with a conventional set of electrolytes, also disinfectants - chloroisocyanurates, chlorinated sodium tripolyphosphate, sodium hypochlorite, etc.

Thus, the basic components of synthetic detergents are surfactants, water softeners, chemical and optical brighteners, enzymes, foam stabilizers and perfumes. Proportions of ingredients determine the main indicator of the quality of the powder - its detergency efficiency.

2.2. Directions of supplies of key raw materials to enterprises producing detergents in the CIS

As already noted, the primary raw materials for the production of synthetic detergents are **surfactants**. The main source of raw materials for the production of synthetic surfactants is oil and petroleum products. The world production of surfactants is 2-3 kg per capita per year. In this case, about 50% of released surfactants is used for the production of household chemicals (detergents, cosmetics), the rest - in industry (the textile, leather, paint and coatings industry, metallurgy, oil production, etc.) and in the agriculture (the crop protection).

In **Russia** about 80-115 thousand tons of surfactants is released in a year (in 2011 - 84.2 thousand tons). In this case, over 70% of production is accounted for JSC "Nizhnekamskneftekhim". In addition, the major manufacturers of surfactants are LLC "Plant of synthanols" and JSC "Ivkhimprom" (Table 3)

Table 3: Basic types of raw materials for the production of synthetic detergents and suppliers in Russia

Raw materials	Suppliers
Surfactants	JSC "Nizhnekamskneftekhim" (Republic of Tatarstan) LLC "Plant of synthanols" (Nizhny Novgorod region) JSC "Ivkhimprom" (Ivanovo region). Novocheboksarsk JSC "Khimprom" (Chuvash Republic) JSC "Kazanorgsintez" (Republic of Tatarstan) JSC "Factory of Novochoerkassk Synthetic Products" (Rostov region) LLC "Zavolzhskiy Chemical Plant" (Ivanovo region) JSC "Synthesis OKA" (Nizhny Novgorod region) JSC "Irbitsky chemical-pharmaceutical plant" (Sverdlovsk region) Imports
Sodium tripolyphosphate	CJSC "Metakhim" (Volkhov, Leningrad region) Imports (Kazakhstan)
Soda ash	JSC "Soda" (Sterlitamak, Republic of Bashkortostan) JSC "Berezniki Soda Plant" (Perm Territory) JSC "Achinsk Alumina" (RUSAL, Krasnoyarsk Territory) CJSC "Pikalevo soda" (Leningrad region) Imports (Ukraine)
Sodium percarbonate	JSC "Perkarbonat" (Novocheboksarsk, Chuvash Republic)
Sodium sulfate	JSC "Kuchuksulfat" (Altai Territory) JSC "Novotroitskiy Chromium Plant" (Orenburg region) JSC "Volzhsk Orgsintez" CJSC "Russian Chrome 1915" (Sverdlovsk region)
Sodium silicate and water glass	JSC "Salavatsteklo" (Republic of Bashkortostan) CJSC "Stroitelnyi kompleks" (Chelyabinsk region) JSC "Ivkhimprom" (Ivanovo region) CJSC "Russian Chrome 1915" (Sverdlovsk region) LLC "Oksium" (Ulyanovsk region) Import (Belarus, Ukraine)
Carboxymethyl cellulose	CJSC "Karbokam" (Krasnokamsk, Perm Territory) LLC "Davos Trading" (Aksai, Rostov region)

	CJSC "Politsell" (Vladimir) FSOE "Combine "Kamensk" (Rostov region) LLC "Biya-Khim" (Biysk, Altai Krai) Import (Finland, Belgium)
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Source: "InfoMine" on the basis of the railway transportation and customs statistics of the Russian Federation

Imports of surfactants to Russia for different purposes is of the order of 100 thousand tons per year. For the production of synthetic detergents and cosmetics more than 70 thousand tons is used. The largest recipients of imported surfactants are the manufacturers of detergents such as "Procter & Gamble-Novomoskovsk", LLC "Henkel Rus", LLC "Unilever Rus", etc (Table 4). Small amounts of the raw materials import JSC "Nevsky Cosmetics", JSC "Vesna", etc.

Note that for the production of cosmetics surfactants are purchased abroad by LLC "Revada" (Moscow), CJSC "Petrosvet" (St. Petersburg), LLC "Cognis Rus" (Moscow), LLC "Red Line" (Moscow), LLC "Kapella" (Nizhny Novgorod region), etc.

In general, the needs of Russian enterprises in the surfactants are about 200 thousand tons per year, including about 130 thousand tons used in the manufacture of detergents and cleaners.

Table 4. Russian imports of surfactants for the production of synthetic detergents in 2010-2011

Recipient	Country-supplier, Company-producer	Name of surfactant	Delivery volume, ton	
			2010	2011
LLC "Procter & Gamble-Novomoskovsk"	United Kingdom, PROCTER & GAMBLE Supply Product UK Ltd	Paste Fairey - surfactant, aqueous solution, containing 51.1 wt% of alkyl ethoxy sulfate and alkylamine oxides for the production of liquid detergents	25531,4	28352,7
	Belgium, Dow Corning Europe S.A.	Powdered zeolite-based defoamer, ampholytic surfactant with simultaneous anionic and cationic activity		
	Germany, CLARIANT Producte (Deutschland) Gmbx	40% cationic surfactant (aqueous solution of alkyldimethylhydroxyethyl of ammonium chloride, CBD-based)		
	USA, BASF Corp.	Sokalan PG - nonionic surfactants based on alkylene glycol		
	France, Huntsman Surface Sciences	Empikol - anionic surfactant for the production of liquid detergents (a 70% water solution of sodium lauryl sulfonate ethoxylate)		
LLC "Henkel Rus": branches in the city of Perm, and in Engels (Saratov region)	India, GALAXY Surfactants Ltd.	the surfactant Galaxy cocoamidopropyl betaine plus for the production of liquid detergents	4591,6	10799,7
	Germany, CLARIANT Producte (Deutschland) Gmbx, EVONIK Goldschmidt Gmbh (REWOQUAT), BK GIULINI Gmbh	Texcare SRA-300 F - a crystalline anionic surfactant; Revokvat BE 18 DPG - a cationic surfactant (methyl triethanolamine-ammoniummethylsulfate dialkyl ester - 85%, dipropylene glycol -15%) for the use in fabric conditioners as a softening agent; Macrohost - a granulated powder (nonionic surfactant) for the production of detergents for dishwashers		
	Germany, France, Netherlands, Italy, HENKEL	nonionic surfactants and other raw materials for the production of cleaners and detergents		
	Belgium, BASF	Lutensol - a nonionic surfactant based on fatty alcohols		
	United Kingdom, CRODA Europe Ltd.	Crodasinic - surfactant (anionic detergent) - sodium lauroylsarcosinate		
JSC "Henkel-ERA", Leningrad region	Germany, EVONIK Goldschmidt Gmbh, COGNIS Deuthschland Gmbh	DEHYDOL - nonionic surfactant (ethoxylated fatty alcohol); TEGO BETAIN - amphoteric surfactant (water solution of alkyl-dimethylamidopropyl betaine); TEXAPON N 70 - anionic surfactant (aqueous solution of sodium sulfoethoxylate) for the production of liquid detergents	1155,2	908,6
	India, GALAXY Surfactants	surfactant GALAXY - cocoamidopropyl betaine (KAPB+) for the		

	Ltd.	production of liquid detergents		
	Sweden, AKZO NOBEL Surface Chemistry AB	DUOMEEN O - surfactant based on alkyldiamine (oleylpropylendiamine) for the production of liquid detergents		
LLC "Unilever Rus", Moscow, St. Petersburg	Poland, PCC ROKITA	SULFOROKANOL - anionic surfactant for the production of cleaners, detergents and cosmetics	3223,0	1322,5
JSC "Nafis Cosmetics"	Germany, BASF	SOKOLAN - nonionic surfactant (aqueous solution for the production of powdered and liquid detergents)	262,8	297,8
CJSC "Aist"	Germany, CLARIANT Producte Gmbx	GENAPOL LA 030 (laureth 3) - nonionic surfactant for the production of liquid detergents	75,2	38,3
		PRAEPAGEN TQ - cationic surfactant (ester of quaternary ammonium compounds)		
		HOSTAPUR SAS 60 - anionic surfactant (sodium secondary alkyl sulfonate)		
LLC "Farnos", Leningrad region	Germany, BASF; COGNIS Gmbh; Sweden AKZO NOBEL; France, SEPPIS SA Netherlands, UNGER FABRIKKER A.S.	nonionic surfactants and other raw materials for the production of cleaning agents and detergents	62,5	67,1
Others, including manufacturers of cosmetics and shampoos, as well as trade and supply organizations, and dealers of major foreign companies			27930,3	29982,3
Total surfactants for the production detergents and cleaners, and cosmetics			62832	71769

Source: "InfoMine" on the basis of customs statistics of the Russian Federation