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NEGATIVE EFFECT OF CHEMICAL BLEACHERS ON THE HUMAN ORGANISM

Abstract. The article contains information on the composition of household chemicals containing many harmful substances that not only harm the fragile ecosystem, but also have a very detrimental effect on human health, leading sooner or later to chronic human diseases. To date, especially used chemicals are bleaching agents in everyday life and cosmetology. They are second in importance after everyday household chemicals. All these substances differ in the mechanism of action, the effectiveness of bleaching and the severity of the toxic effect on cells.

Keywords: chemistry, bleaches, negative impact, organism, chlorine, hydrogen peroxide.

According to most people with chemical phenomena and reactions can only be found in specialized or school chemistry laboratories. In fact, we are confronted with chemicals in everyday life [1-2].

The composition of household chemicals includes many harmful substances that not only harm the fragile ecosystem, but also have a very detrimental effect on human health, leading sooner or later to chronic human diseases [3-5]. Producers argue that in household chemicals, the amount of harmful substances is minimal, but they "forget" to mention the fact that the combined effect of all components that causes real harm to health (Fig. 1).

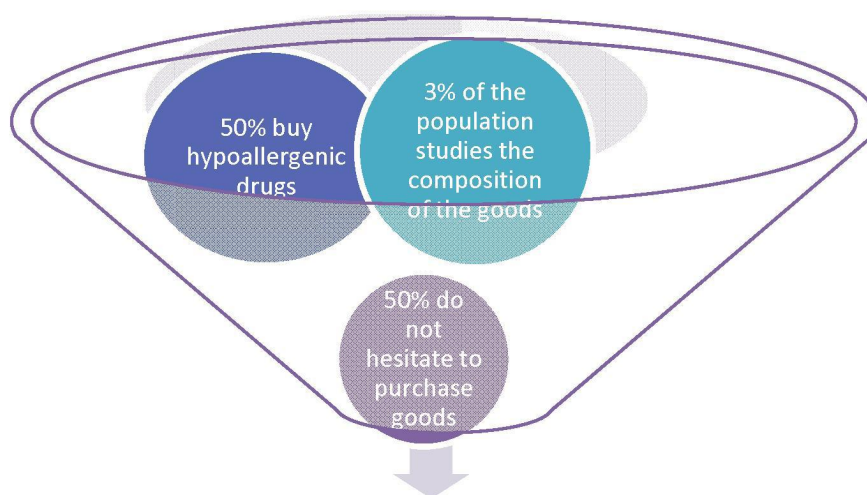


Figure 1 - Consumption of household chemistry by the population

To date, highly consumed chemicals are bleaching agents. They are the second most important after powders of household chemicals in the arsenal of home laundry. In Russia, up to the last century, linen fabrics were bleached, alternating with their freezing on bright winter sol with soaking in the ice.

Cotton bleaching was known back in ancient Egypt. Then this process was carried out under the influence of solar color.

In England, until the 18th century, a special technology was used for bleaching cotton and flax: alternating a long-lasting exposure of the laundry to the sun, soaking in sour milk, washing, rinsing and subsequent aging.

In 1822, the Parisian pharmacist A. Labarrac produced a bleaching solution identical to the modern "Asu", slightly improving the way of obtaining "zhaveleva water". Thus, a new generation of bleach was in fact used in France since the XIX century [6-7]. Thus, among such compounds, hydrogen peroxide and its inorganic derivatives are also widely used (Fig.2).

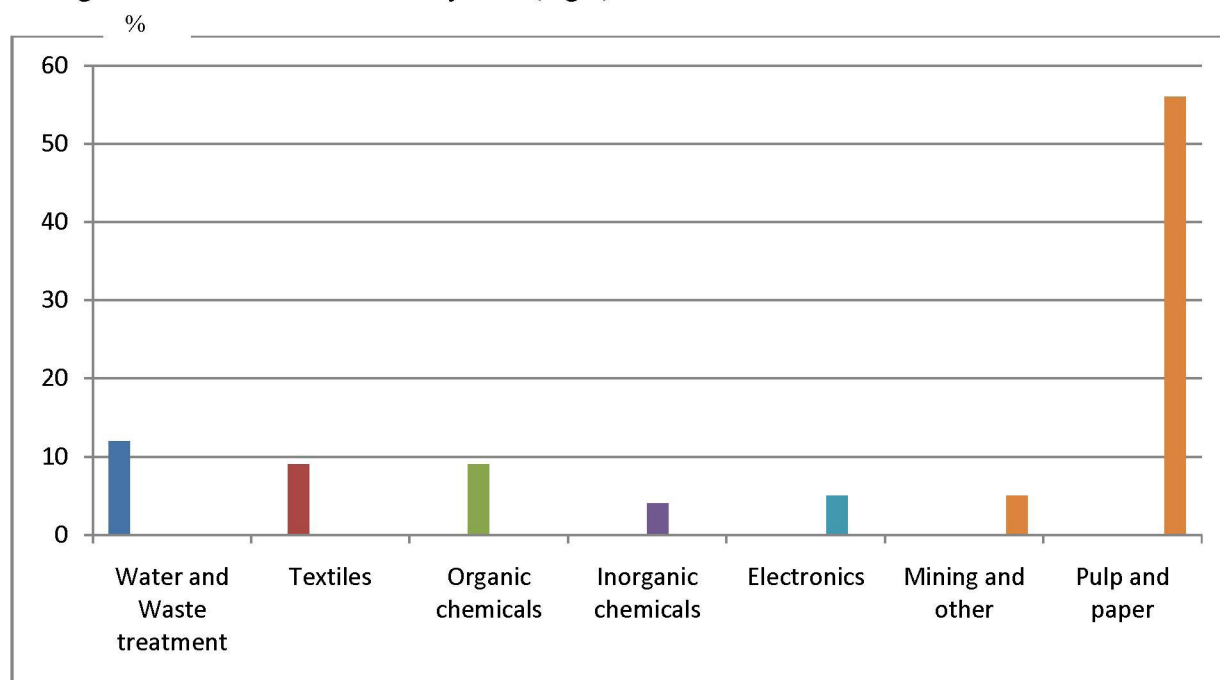


Figure 2 - Use of chemicals in industries

The industry produces new varieties of bleaching agents for things. The main groups of proposed tradeinfunds:

- optical - the feature of these means is the ability to reflect light by special particles. This achieves the effect of whitening. Most detergent powders have reflective particles that give things whiteness. But they are not capable of washing heavily soiled things. Wiping off these powders, you can see that the colored linen shed;

- on the basis of chlorine-containing compounds - Chlorine and organochlorine compounds - hypochlorite (ClO⁻) or sodium hypochlorite (NaClO). Chlorine (Cl) and its compounds are found in many products: bleaches - ACE (chlorine-containing bleaching agents) detergents for dishwashers and hand-washing dishes (Prill) disinfectants - whiteness, Comet (gel or powder with chlorinol), Domestos (very concentrated, practically "poison" for the respiratory system, cannot be used in everyday life) means to combat mold;

- oxygen-containing - a new generation of bleach. They are able to delicately return the whiteness even without boiling, suitable for fabrics from any composition. There are two types of bleach containing oxygen: in bulk or in the form of a solution.

Chlorine has an irritant effect on the mucous membranes of the respiratory tract and eyes, leading to primary inflammatory changes, to which a secondary infection is easily attached. With low and moderate concentrations of chlorine, poisoning is accompanied by the following symptoms: rapid breathing pain and chest tightness, dry cough, hoarseness of voice, lacrimation and pain in the eyes, fever, increased white blood cell count, toxic pulmonary edema, bronchopneumonia convulsions, depressive conditions.

For healthy people, 4000-6000 milligrams of chlorine per day is sufficient. But you need to consider that this includes chlorine, which is contained in ready-made food, in water, and in salt, which we throw

into dishes. The maximum dose of chlorine - 7000 milligrams - still does not cause harm to humans, but it is impossible to consume such doses at all times - there will be an excess of chlorine. If a person is hot, he is actively engaged in sports and sweats (and chlorine is excreted with the products of decay), chlorine needs more. As with diseases of the digestive tract [8-10].

The need for chlorine for children in milligrams is from 300 mg at the age of up to 3 months to 2300 mg at the age of 18. In more detail, children's doses of chlorides can be considered in table 1.

Table 1 - Need for chlorides, mg per day

| | | | | | |
|-------------------------|-----------------|---------------------------|-------------|-------------|-----------|
| children | 0-3 months | 4-6 months | 7-12 months | 1-2 years | 2-3 years |
| boys | 300 | 450 | 550 | 800 | 800 |
| girls | 300 | 450 | 550 | 800 | 800 |
| Pupils and Preschoolers | | | | | |
| Preschoolers | Junior students | Secondary school students | | Adolescents | |
| 3-7 years | 7-11 years | 11-14 years | | 14-18 years | |
| 1100 | 1700 | 1900 | | 2300 | |

In addition to whitening accessories, people also use bleaching agents in cosmetology and dentistry. Cosmetic bleach agents can contain the following substances as active components: hydroquinone ($C_6H_4(OH)_2$), hydrogen peroxide (H_2O_2), kojic acid ($C_6H_6O_4$), arbutin ($C_{12}H_{16}O_7 \cdot \frac{1}{2} H_2O$ is a part of extracts of bearberry, paper mulberry and some other plants), ascorbic acid derivatives ($C_6H_8O_6$), licorice extract, as well as alpha hydroxy acids, retinoids and a number of other substances. All these substances differ in the mechanism of action, the effectiveness of bleaching and the severity of the toxic effect on cells.

Most often, all kinds of peelings and scrubs are used to whiten the skin, since when the upper layer of the skin is exfoliated, the tone becomes much lighter. On the type of skin, as well as on the intensity of pigmentation will depend on what kind of tool you need.

Many bleaching products that have a strong effect have a lot of side effects, while "light" means do not guarantee the required result and they need to be used for a very long time.

The strongest bleaching agent is hydroquinone, but it is also the most toxic. In fact, its toxicity is the cause of its whitening effect. Hydroquinone inhibits the vital activity of all skin cells, but melanocytes (cells producing melanin pigment) are several times more sensitive to it than other cells. This allows you to choose a concentration in which melanocytes stop producing melanin, and the rest of the skin cells will not suffer much. Hydroquinone is usually used in a concentration of 2-4%, depending on the severity of pigmentation. Hydroquinone-based products are particularly popular in Asian and African countries, where the lightest skin is considered to be the most beautiful. Hydroquinone is absorbed through the skin into the blood, so it can not be used during pregnancy and feeding. With prolonged and abundant use of hydroquinone, a rare skin disease can develop - chronic disease accompanied by darkening of the skin.

When using whitening pastes and powders, mechanical clarification in dentistry does not always give the desired result, therefore people resort to chemical teeth whitening. Chemical whitening of teeth is the effect of quite strong chemical preparations that not only change the shade of the coating, but also affect its structure. If the enamel has acquired a yellowish color over time, it is not difficult to fix it. Much more difficult and longer dentists are struggling with a brown or grayish color. The whitening mixture can only act on the even surface of a healthy human tooth. A dentist can perform an operation of professional cleansing or it can be done at home on his own, but only after the appointment of a doctor and under his expert supervision. In this case, substances such as hydrogen peroxide (H_2O_2) or urea ($(NH_2)_2CO$) of high concentration are used. The concentration of peroxide in such a mixture is from 16 to 38%. To enhance and speed up the effect, doctors use laser or light irradiation, which helps to activate the action of peroxide.

- There are a number of contraindications to the operation of clarification, this is primarily:
- pregnancy of the patient or lactation period;
- small age of the patient - you can not bleach before the teenage period;

- artificial teeth or crowns of polymeric materials;
- unprotected areas or defects in tooth fillings;
- damaged, painful teeth or caries;
- chronic diseases or presence in the body of any inflammatory process.

In the European Union since 1987, some chlorine compounds have been banned, or their use is limited, as they can cause: hypertension, anemia, cardiovascular diseases, contributes to the development of arteriosclerosis of the vessels, affect the condition of hair and skin, cause allergy, bronchial asthma and emphysema, promotes the activation of pulmonary tuberculosis, increase the risk of oncology, reduces immune defense, suppressing T and B lymphocytes.

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АДАМ АҒЗАСЫНА ХИМИЯЛЫҚ АҒАРТҚЫШ ЗАТТАРЫНЫҢ ӘСЕРІ

Аннотация. Мақалада күнделікті тұрмыста қолданылатын көптеген химиялық зиянды заттарының экожүйеге және адам ағзасына тигізетін теріс әсері туралы мағлұматтар келтірілген. Бұл заттарды қолданудың соңы созылмалы ауруларға әкеліп соқтыратыны айқын. Бүгінгі таңда тұрмыс пен косметологияда аса көп қолданылатын химиялық заттардың ішінен ағартқыш қасиеттері бар қосылыстар кеңінен таралған. Олар күнделікті тұрмыстық химиялық заттардан кейінгі екінші орындағы маңызы зор болып саналады. Бұл заттардың барлығы әсер ету механизмі, ағарту тиімділігі және жасушаларға улылық әсері жағынан ажыратылады.

Тірек сөздер: химия, ағартқыштар, зиянды әсері, ағза, хлор, сутегі тотығы.

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НЕГАТИВНОЕ ВЛИЯНИЕ ХИМИЧЕСКИХ ОТБЕЛИВАТЕЛЕЙ НА ОРГАНИЗМ ЧЕЛОВЕКА

Аннотация. В статье приведены сведения состава бытовой химии содержащей множество вредных веществ, которые не только вредят хрупкой экосистеме, но и весьма пагубно влияют на здоровье человека, приводя рано или поздно к хроническим заболеваниям человека. На сегодняшний день особо употребляемыми химическими веществами являются отбеливающие средства в быту и косметологии. Они являются вторыми по важности после повседневных средств бытовой химии. Все эти вещества различаются по механизму действия, эффективности отбеливания и выраженности токсического действия на клетки.

Ключевые слова: химия, отбеливатели, негативное влияние, организм, хлор, перекись водорода.

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