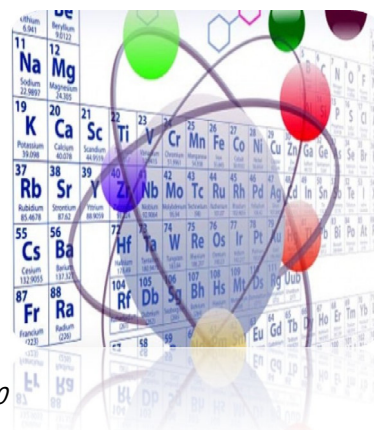




Bleach Effectively in Removes The Stubborn Stains

Moondra Zubir*, Ayi Darmana, Marini Damanik, Hafni Indriati Nasution, Osi Annauli G, Vriili Coirala Rama Uli Siregar, Yosi Santika Silitonga.

Bilingual Program of Chemistry Depatment, Faculty of Mathematics and Natural Sciences, Universitas Negeri Medan, Jl. Willem iskandar Ps. V, Medan estate, Indonesia.

**Email :*

ABSTRACT

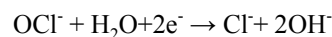
Along with the development of science and technology, more and more types of manufactured goods produced to meet our needs we need to know that among these materials there are dangerous or toxic, therefore it is very important for us to know the type, nature, usefulness, as well as the dangers of every chemical that we use at home As we know, all kinds of objects that are around us are actual material, all material consists of chemicals but, in our daily lives we commonly use the term material instead of chemicals. Clothing that we use every day will be prone to stains so it is important to know how to remove stubborn stains on clothes. It would be very inconvenient if the clothes worn are dirty and not beautiful to the eye. There are many types of stains, ranging from dirty sweat, blood, residual makeup, black spots caused by fungus, to stains from the outside such as stains caused by rust, paint, oil, ink or spills of food and drinks. If you use the wrong method to remove these stains, it is not uncommon for us to find difficulties and can even be fatal as they get dirty. Each type of stain has a different treatment, depending on the nature of the stain. Bleach is now available as a solution to the problem of stains on these clothes.

Keywords: stains, bleach, natural material, artificial whitening

I. Introduction

Bleach is a compound that can be used to remove colors, such as textiles, hair and paper. Bleaching agents are chemicals that can be used to treat stubborn dirt. Color loss occurs through oxidation reactions. Oxidators which are usually used are sodium hypochlorite (NaOCl) and hydrogen peroxide (H₂O₂). The color in the clothes will disappear through the oxidation reaction. Oxidizers which are often used are sodium hypochlorite (NaOCl) and hydrogen peroxide (H₂O₂). The oxygen is able to remove

electrons, so the color will disappear. The reaction:



Some chemicals used as bleach include: chlorine (CaOCl₂), Calcium hypochlorite (Ca(OCl)₂), Sodium hypochlorite: NaOCl, Sodium Perborate: NaBO₃. (cloth looks cleaner). In addition to dirt, whitening agents will also react with dyes (on colored fabrics) and react with body tissues. Remembering the nature of the whitening ingredients above, caution is required in the use of bleaching agents.

The main ingredient of solid bleach (white powder) is calcium hypochlorite with the chemical formula $\text{Ca}(\text{ClO})_2$, commonly known as chlorine. Chlorine is usually used to clean tap water and swimming pools. Chlorine also has a pungent odor.

Chemical compounds that have the chemical formula $\text{Ca}(\text{ClO})_2$ IUPAC name Calcium hypochlorite. Chlorine is usually used as a disinfectant. Calciumhypochlorite is in the form of white solids, although commercial preparations appear yellow. Strong chlorine odor, due to slow decomposition in humid air. Very difficult to dissolve in water and more widely used in water with low to moderate hardness. This compound is available in two forms, anhydrous and hydrate. Calcium hypochlorite is generally used for sanitation of public swimming pools and drinking water disinfectants. Calcium hypochlorite is also used in the kitchen as a surface disinfectant and in kitchen utensils. Other common uses include cleaning the bathroom.

Bleach ingredients that we can use naturally to clean clothes, for example lemon and lime leaves. The use of natural whitening ingredients is very simple, such as to avoid the use of chemical-based bleach, washing with natural ingredients can be an option. We often encounter detergents specifically in white clothing containing natural ingredients, which are lemon. Lemon orange can also be used directly to whiten clothes. You do this by inserting a few slices of lemon in hot water, then enter the clothes. Soak for about two hours to get maximum results and can wash it normally.

Pigmentation is the process of changing skin color due to the formation of melanin. Melanin is a substance that gives brownish or blackish brown color to the skin. Melanin is formed in melanocytes and is influenced by the enzyme tyrosinase. This melanin formation process is usually called melanogenesis. Melanin formation will be faster if the tyrosinase enzyme works actively by being triggered by ultraviolet light. Enzimtyrosinase is synthesized in the endoplasmic reticulum (RE). Furthermore, this enzymatrosinase will regulate the melanin biosynthesis by hydroxylating L-tyrosine into L-dopa and then oxidizing L-dopamenjadidopaquinon.¹

Besides being known as a fruit full of vitamins that are good for health, papaya can also be used as a face whitener. So far Papaya (*Carica papaya*) is

commonly used as a base for skin lightening soap. This is because papaya has a high content of ascorbic acid (Directorate of Nutrition, Ministry of Health of the Republic of Indonesia 1992) and ascorbic acid can act as an inhibitor of tyrosinase.² The ascorbate content can inhibit the work of the enzyme tyrosinase as well as in yam fruit.

Bleach solutions sold on the market usually contain the active ingredient sodium hypochlorite (NaOCl) of about 5%. While the bleaching powder contains calciumhypochlorite (CaClO) compounds. Hypochlorite compounds easily release chlorine. In high levels, chlorine can damage clothing. Hypochlorite Bleach is not good for polyester materials, because it gives the impression of yellow rather than whitening.

In general, bleach sold on the market is safe to use as long as it is used according to instructions. In addition to stains, this substance can also react with clothing dyes so that it can fade the color of the clothes. Therefore, the use of this bleach must be as directed. Bleach is a very reactive chemical. Mixing bleach with other household ingredients can be very dangerous. For example, if the bleach is mixed with a toilet cleaner containing hydrochloric acid, it can produce chlorine gas. Gaschlorine can damage the respiratory tract, and if its size is large enough it can be deadly. Mixing bleach with ammonia also produces toxic gases, namely chloramine (NH_2Cl) and hydrazine (N_2H_4). Most bleachers are made from very strong chemicals. Generally they are corrosive. Therefore, it must avoid direct contact for a long time.

Bleach is a compound that can whiten clothes through two processes, where the first process is to increase the effectiveness of surfactant work by reducing the size of the molecule of dirt by oxidizing it. While the second process is changing the color of the dirt to white so it is not visible to the eye (invisible). The white color in question is white air, clear water, not milky white. This whitening action is a chemical reaction where the dirt molecules will be broken into smaller parts so that it is easier to be removed by surfactants (but the role of surfactants is to remove stains).

In addition to food coloring agents we know food bleach. For example, oxyhydrochloride, hydrogen peroxide, benzoyl peroxide, acetone peroxide, acid-oxygen, and potassium bromate etc. This whitening agent is good for improving food

colors without damaging the composition of food ingredients.³

For example, bleaching in foods including flour is still new, usually brownish yellow or grayish yellow. These bleaching agents can be used to whiten the flour. Hydrogen peroxide is usually used to whiten the color of milk used to make cheese. There is a whitening agent that has a dual function, namely as a whitening color of food substances as well as reagents to make food ingredients that are soluble in water. For example: sodium hypochlorite is used so that pigeons that are not soluble in water become soluble in water. Besides flour, food whitening ingredients are usually used to whiten trigu, sago flour, corn flour, and rice. So that the color of the food produced looks clean and not dull.

The use of bleach on health is that it can cause diarrhea, seborrhea, fragility of the nails or horn tissue (keratin) and disorders of the kidneys and if the level of calcium in the blood goes down to normal then calcium in the bones will be mobilized so that the formation of new bone will be inhibited.

While we think that the whitening used by people is less safe for the skin can make chapped skin, so we made the idea to make a whitening formula to remove stubborn stains that are safe for the skin so that the skin is not cracked by measuring the materials used accordingly with standards for skin health. With the measurements we use such as: Adding NaClO as much as 30%, emal-70 as much as 2%, perfume as much as 1% and we use water as much as 67%.⁴

II. Experimental Method

Chemicals was used in this experiments are : Emal-70 (2%), NaClO (30%), Perfume (1%) and Water (67%)

Before start the experiment, use a mask and gloves and prepare the tools and materials needed. 20 ml of partial water was mixed with emal-70 into 1 ml of water then stir using a spatula. After the two solutions are mixed then add 15 ml of NaClO and 2 drops of perfume, then stir. Next, mix the remaining available water into the solution that has been stirred earlier. Filter the solution with a funnel and Finally pack the solution that has been filtered into a bottle.

III. Results and Discussion

Table 1. Whiteness observation from various sample

Sample (g/kg)	Whiteness (W)					Average
Blanc	89.8	89.6	89.7	89.6	89.8	89.75
400	79.9	79.6	79.7	80.4	88.4	80.02
471	81.1	80.8	80.9	80.8	80.8	80.92
526	88.1	88.0	88.1	88.2	88.1	88.14
571	88.7	88.7	87.4	88.7	88.8	88.50
609	88.9	88.7	88.7	88.8	88.7	88.83

From Table 1 above, it can be seen that the results of the degree of white fabric made by etching have not been able to match the value of the white degree of the blank fabric. This shows that there is still residual fixation of dyes in the fabric which results in the degree of white being still below the value of the degree of white blank.

From Table 1 also above, it can be seen that the value of the white degree increases with greater concentration of the etching agent. The percentage increase in the degree of white ranged from 1% for each increase in concentration with a significant increase occurred in the concentration increase of 471 g / kg to 526 g / kg. These results are in accordance with the understanding of the theory that BAYCLIN contains an oxidizing agent in the form of NaOCl which functions as a etching agent to oxidize dyes that have been fixed on the fabric. NaOCl is an oxidizing agent that has a relatively high oxidation power when compared to hydrogen peroxide or Sodium Chlorite.

So that at a concentration of 400 g / kg it already has a high oxidation power which is indicated by the value of the white degrees which differ only by 10 scales below the value of the white degrees of blank cloth. Along with the greater concentration of the etching agent, the stronger the oxidation power is due to the more radical oxygen it produces. The stronger the oxidation power, the more oxidized dyes on the fabric are characterized by increasing degrees of white.

In the oxidation process, there will be a reaction between the oxidizer and reactive dyes that have been fixed in the fabric. Parts of dyes that are susceptible to oxidation are chromophores and auxochromes which are the color carriers and connecting groups.

Drimarene Blue K2-RL reactive dyes are cold reactive dyes with reactive groups mono- chloro, fluoro triazine and chromophore groups anthraquinone group.

The anthraquinone chromophore group has a relatively high oxidizing resistance because of its cyclic and conjugated structure. With the reaction between the oxidizer and the dye, the amine auxochrome group is more susceptible to being broken off and the nitrogen that previously connected the chromophore and the reactive group becomes binding to oxygen radicals into nitro so that the dye becomes separated between the chromophore group and the reactive group. With the chromophore group being disconnected, the dyes will lose their color and leave the reactive groups that still covalently bind to the cellulose. As more and more chromophore groups are separated, the color will fade / grow younger and turn white according to the initial color of cotton fibers which have a cellulose structure. But in the process of color destruction, the oxidizer is not only specifically separating the chromophore from the dyestuff reactive group, but it can also damage the cellulose polymer in cotton fibers, known as oxycellulose.

The invention is a composition and method that effectively eliminates stubborn stains, grease, blood, mold and dirt from soft fabric surfaces and hard painted wood, concrete or stucco Surfaces. In addition, the method of the present invention is capable of eliminating the damaging effect of bleach-containing solution on soft fabrics and hard composites. comprises alkyl dimethylbenzyl ammonium chlorides, bleach, and water. Preferably, the stain removing composition comprises, in percentage weight about Alkyl (50% C14, 40% C12, 10% C16) Dimethyl Benzyl Ammonium Chlorides 1-2%. (ADBAC), and bleach and water about 98- 99%. Preferably, the bleach used is sodium hypochlorite, calcium hypochlorite, or sodium dichloroisocyanurate; but other known types of bleach, including but not limited to oxygen bleaches, may be used. It was very Surprising to discover that weak bleach is effective for removing stubborn stains when used in combination with the above, and when applied to soft colored fabrics does not damage or bleach out the color in any way. It is noted that a variety of combinations and varying percentage weights may be possible.

The three or more components are mixed together in a container to form a cloudy mixture and then applied to the area of application for cleaning. Preferably, the components are mixed together in a spray container, but may be mixed in any kind of dispensing device. Unlike other compositions, which must be quickly removed from soft textile fabrics after application in order to prevent damage, the present invention does not need to be quickly removed. On the contrary, the present invention can migrate into fabric including seeping through the backing of carpet and dissolve into the backing without the need for using a vacuum or other

Sucking device to remove the composition quickly after application. It is noted that the present method may include rinsing or removal of residual, but it is not necessary or required. When cleaning dirt or mold from a hard surface it may be advantageous after application to use a sponge or cloth to remove mold, grease, dirt and grime. However, after application to Soft fabric materials, most stains will disappear on the spot without the need to wipe or remove excess residual.

Another embodiment of the present invention relates to a method of removing a stain from a textile (including a hard or Soft fabric) comprising the steps of applying to a stained area of the textile the composition prepared by mixing alkyl dimethylbenzyl ammonium chlorides, bleach, and water. After the composition has been applied to the area of application it remains thereon for a pre-determined amount of time, which may include indefinitely. Under certain circumstances, the composition may be removed after a pre determined amount of time using a Suction device. Such as a vacuum, or wiped away using a sponge or cloth. The process may be repeated several times until the stain is removed. Eventually, water may be applied to the area to dilute the composition and aid in the removal process.

It should be noted that it is known to use ammonia and hydrogen peroxide to remove stubborn carpet stains including those from coffee, tea and blood. While this known composition is effective, it results in a noxious and toxic odor. The present composition and method removes similar stains more effectively and simultaneously returns the textile to its original new scent. Thus, the present method allows use of the composition in large quantities and in all environments, including

rooms that are not ventilated or include children and pets, eliminating the concern of bodily harm from fumes and skin contact.⁵

The present invention is useful for removing stubborn stains, blood, mold and dirt from soft fabric surfaces like jeans, carpet and upholstered furniture and hard painted wood, plastic, tile, stainless steel, concrete, glass or stucco Surfaces. Unlike many other products, the present invention cleans the stained surface and does not leave behind a film or residue that is common with many other cleaning products.

Further, the present combination is also available for mixture with other cleaning solutions for carpet, upholstery, soaps and detergents as a disinfecting agent, deodorizer or cleaning agent for removing stains on clothes, curtains or other fabrics. Moreover, the present combination may be utilized as a cleaning agent for power washing a home, deck or other outdoor article (such as an outdoor shower, trash cans or bins). For example, a clapboard, wood home, or pressure treated deck can be power washed with the present combination to remove all mold, mildew and algae caused by damp ocean air and the like. Up until now, scrubbing the home by hand repeatedly was the only way to remove such tough stains.

IV. Conclusion

A composition for removing stains comprising: a quantity of alkyl dimethylbenzyl ammonium chlorides; a quantity of bleach; and a quantity of water. The composition for removing stains, wherein the quantity of alkyl dimethylbenzyl ammonium chlorides is present in a range of 1-2% of the total weight of the composition. The composition for removing stains, wherein the quantity of bleach and the quantity of water is present in a range of 98-99% of the total weight of the composition. The composition for removing stains, wherein the quantity of bleach is selected from the group consisting of Sodium hypochlorite, calcium hypochlorite, sodium dichloroisocyanurate, and oxygen bleach.

The method of removing stains of claim further comprising the steps of: removing the applied composition from the stained area. The method of removing stains, wherein the process of removing the applied composition is selected from the group consisting of a Suction device, a sponge, and a cloth. The method of removing stains of

claim, wherein the type of stain to be removed is selected from the group consisting of stains, blood, mold, and dirt. The method of removing stains, wherein the surface of the stain to be removed is selected from the group consisting of jeans, carpet, upholstered furniture, hard painted wood, plastic, tile, stainless Steel, concrete, glass and Stucco.

The method of removing stains, further comprising the step of mixing the composition with a quantity of a second cleaning solution. The method of removing stains of claim, wherein the second cleaning solution is selected from the group consisting of soaps, detergents and deodorizers.

References

1. E. P. A. Kumbasar, A. E. Korlu, Candan Akca, (2011) The effects of activator on whiteness and hydrophilicity during the hydrogen peroxide bleaching of *Tekstik ve konfeksiyon*, 21, 50-57.
2. N. Sharma, S. Tripathi, N. K. Bhardwaj, R. Varadhan, (2013) Enhancement of pulp brightness and whiteness using TAED during bleaching, *IPPTA: Quarterly Journal of Indian Pulp and Paper Technical Association*, 25, 173-175
3. Hui Li, Zuquan Jin. (1996) A study on the application of sodium percarbonate in the scouring and bleaching of cotton fabrics. *J. Textile auxiliaries*. 13(6)15'19-20.
4. Zhi LI, Yanling WANG and Zhichao WANG (2016) , Study on Bleaching Technology of Cotton Fabric with Sodium Percarbonate, *MATEC Web of Conference*, 67, 06048
5. C. Xu, D. Hinks,*, A. El-Shafei, P. Hauser, M. Lia, M. Ankeny, K. Lee, (2011) Review of Bleach Activators for Environmentally Efficient Bleaching of Textiles *Journal of Fiber Bioengineering & Informatics* 4:3 209–219