International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 01 Issue 07 October 2021

Page No: 119-122

DOI: https://doi.org/10.47191/ijpbms/v1-i7-07 , Impact Factor: 5.374

Application of Benzol Sulfonates in the Preparation of Detergents

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ABSTRACT

In this article the usage of alkilbenzene is considered as a washinh facility. This scientific article also suggests the most cost-effective and inexpensive way to make soap. Household detergents can be solid, liquid or powder, detergents in powder form differ from liquid form not only in physical form but also in the proportions of its components, the amount of surfactants is higher than in powder form, liquid detergents studies of spatial separation observation during long-term storage are presented.

The article also discusses the study of the addition of surfactants from detergents to improve the washing properties of soap, as well as reduce its absorption, as well as the reduction of the cost of soap due to the addition of clay from local raw materials.

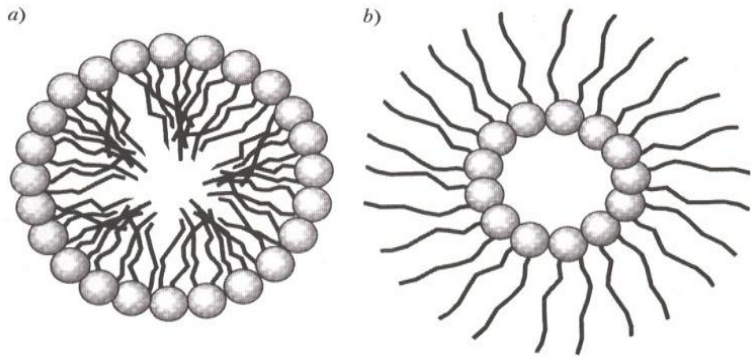
KEY WORDS: SAW; cationic; anionic; amphoteric; detergent; structure; micelle; ferment; emulsion phase.

ARTICLE DETAILS

Published On:
27 October2021

Available on:
https://ijpbms.com/

It is known that 75% of the demand for surfactants (Surfactants) in the world market is made up of household goods. Most of these are composed of various mist surfactants. The requirements for surfactants used in the washing process are different: one is to disperse the oil, the second is to stain, the third is to disperse the various types of dirt, and the other is to act as a resorbent to prevent re-absorption of the washed dirt. characterized by. Surfactants are adsorbed on the surface at the phase boundary, reducing the surface tension force; the surface moistens the surface, forming a stable foam. Forms micelles and emulsifies oils and impurities. The structure of the ideal mycelium is shown in the figure1.



1. Picture. Schematic structure of spherical (a) and inverted (b) micelles

As you can see in the picture, depending on the environment, the micelle is associated with hydrophilic or hydrophobic parts. The association of surfactants in water or other polar solvents is accompanied by a decrease in the free energy of the solution. This creates a surface that separates the aqueous medium from the hydrophobic part of the surfactants. Detailed information on surfactants associated with this surface is given in the literature [1].

Application of Benzol Sulfonates in the Preparation of Detergents

The requirements for surfactants used as detergents vary, and it is worthwhile to list some of them below.

1. Presence of wetting and hydrophilic ability
2. Presence of detergent properties
3. Suspension and emulsification of dirt and oil particles
4. Make enough foam
5. Ability to disperse dirt
6. Prevent re-resorption of dirt
7. Good solubility and fast melting
8. Adsorption on the surface
9. Bactericidal properties
10. Biodegradable and non-toxic properties of the environment
11. Resistance to hard water salts
12. Availability of raw materials and low prices

Linear alkylbenzenesulfonate is fully responsible for all these properties. It is also the most effective of the anionic surfactants. The above requirements reflect the most important properties of surfactants. These indicators are very useful when choosing an surfactants depending on the industry.

Typically, surfactants are classified according to the charge they generate when dissociated in water. The solution should be pH = 7, ie neutral. In this article, we will focus on the four classes of surfactants:

1. Anionic surfactants. Substances belonging to this class form negatively charged particles in surfactants. They foam well in water and wash well. It is widely used in the manufacture of detergents in everyday life due to the high dispersion of oils and stains on the fabric. Examples of anionic surfactants include sulfoethoxylates, alkylbenzenesulfonates, saturated fatty alcohol sulfoethoxylates, and soaps derived from oils.
2. Non-ionic surfactants. They do not decompose into ions when dissolved in water; foaming is lower than that of anionic SFM larvae. But washing oily laundry is more efficient. It is especially effective in highly dispersing oily soils in synthetic materials. Non-ionic SFMs are used in the preparation of composite washing powders based on these properties or in combination with anionic surfactants.
3. Cations are formed when cationic surfactants dissolve in water. Surfactants of this class show antiseptic properties as well as creating a soft softness in washable fabrics. Cationic surfactants contain relatively few substances. These include quaternary ammonium compounds.
4. Amphoteric (sweater ionic) surfactants. When dissolved in water, such substances may be in the form of anions or cations, depending on the medium of the solution. This surfactants has high washing properties. Due to the relative cost of the price tag, laundry detergent is not made from them. They are used in the manufacture of shampoos, creams and other cosmetic products. Amphoteric surfactants include lecithin, a natural substance, and alkylbetain, alkylsulfobetain, and imidazoline derivatives with similar structures.

Household detergents can be solid, liquid or powder. Detergents in powder form differ from liquid form not only in physical form, but also in the proportions of its components. In the liquid state, the filler components are relatively small or non-existent.The amount of SFM is higher than in powder form. Spatial separation can be observed when liquid detergents are stored for a long time. Therefore, when preparing SF solutions from them, the solution must be stable over a wide range of temperatures. The production of surfactants in powder form in industry can be done in different ways.

Their physical properties vary depending on the method of production. There are various technologies for the production of powder detergents. The most important of these is the powder drying method of surfactants solutions. This will reduce the bulk density of the detergents.

Although the concentration of surfactants in the spray solution is small, its concentration increases as a result of construction. The literature on this technology [4,5] is detailed. This is the first technology to be used in the production of powder detergents. According to this technology, a suspension consisting of surfactants and fillers is sprayed on a hot air stream and dried. The result is a layered washing powder. The resulting washing powder has a bulk density of 0.25 - 0.5 g / ml.

In the anglomerization method, the dry detergent surfactants is granulated by combining with liquid binders. The density of the resulting anglomerization product is in the range of 0.5-1 g / ml, which in most cases is close to the highest value.

The third method is to make a dry powder by mixing the ingredients together. This method is very simple and does not require complex technology. However, th e surfactants used must be in powder or powder form. In this regard, the number of surfactants used in this method is limited.

Table 1. The ratio of components used in the preparation of anionic SFMs by spraying

№	Reagent function	Name of components	Quantity %
1.	SFM	Sodium alkylbenzene sulfonate	12-20
2.	Structured	Sodium carbonate Zeolite A	15-30 15
3.	Structural and anti-corrosion	Sodium silicate (solid	3-6

		state)	
4.	Ferment	Ferment	0-2
5.	Resorbent (against dirt re-sinking)	KMS	1-4
6.	Bleach	Persol	0.1-0.3
7.	Smelling	Aromatizator	0.1-0.3
8.	Water	Water	2-4
9.	Filler	Sodium sulfate	Until 100%

Although the density of detergents obtained by anglomerization on the basis of anionic surfactants is high, it is characterized by good foaming and high content of surfactants. Washing powder prepared in this way washes the dirt well. The proportions of ingredients in the preparation of baking soda are given in Table 2.

Table 2. The ratio of ingredients used in the preparation of baking soda by anglomerization

№	Reagent function	Name of components	Quantity %
1.	PAV	Dodecylbenzene sulfonate alcohol ethoxylates	8-12 2-4
2.	Structured	Sodium carbonate	20-50
3.	Structural and anti-corrosion	Sodium silicate (aqueous)	6-10
4.	Prevents dirt from settling again	KMS	0.5-2
5.	Bleach	Fluoresentlar	0.1-0.5
6.	Smelling	Aromatizator	0.1-0.3
7.	Water	Water	1-3
8.	Filler	Sodium sulfate	Until 100%

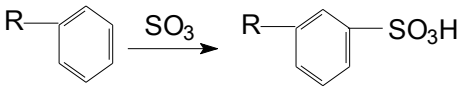
As can be seen from the table, the composition of the anionic and non-ionic components was selected for surfactants. This is effective in converting all types of dirt into micelles.

In the synthesis of alkylbenzenesulfonate, sulfur is first burned in furnaces in an air stream and sulfur (IV) oxide (SO_2) is formed. In the next step, this oxide is converted to SO_3 in the presence of a vanadium (V) oxide catalyst. The chemical reactions that take place can be described as follows.

1) $S + O_2 \rightarrow SO_3 + Q$

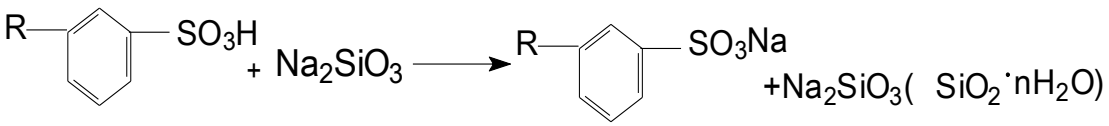
2) $SO_3 + O_2 \xrightarrow{V_2O_5} \rightarrow SO_3 + Q$

The resulting SO_3 gas sulfates alkyl benzene flowing in a thin layer in a special device. The reaction is as follows.



The resulting Surfactants is separated from the alkylbenzene sulfonate separator and purified from sulfuric acid and SO_3. The waste product contains sulfuric acid, SO_3 gas and oleum $H_2SO_4 \cdot SO_3$ and 65-70% alkylbenzenesulfonic acid. The waste is environmentally hazardous due to its black appearance and strong acid mixture.

When the nature and chemical properties of the waste are studied, a silicogel mixture is prepared from it. The resulting silica gel was a very good adsorbent, absorbing the black color of the waste and turning it pale yellow. We describe the reaction to form silicogel as follows



$H_2SO_4 + Na_2SiO_3 \rightarrow Na_2SO_4 + SiO_2 \cdot nH_2O$

$SO_3 + H_2O + Na_2SiO_3 \rightarrow Na_2SO_4 + H_2SiO_3\ (SiO_2 \cdot nH_2O)$

Reactions show that all the dangerous substances with strong acids are neutralized and turned into components for the preparation of detergents. It is now possible to prepare a powder detergent directly by mixing this mixture with Na_2CO_3. Adequate amount of baking soda can be prepared using the above method. The prepared washing powder is characterized by softness, high foaming and excellent washing properties.

Surfactants can also be neutralized by neutralizing alkylbenzenesulfonate. In this case, it is advisable to use an ammonia solution produced by the "Navoiy azot". The following reactions take place.

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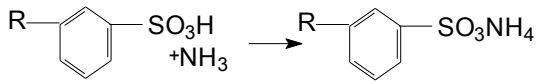

$H_2SO_4 + 2NH_3 \rightarrow (NH_4)_2SO_4$

$SO_3 + H_2O + 2NH_3 \rightarrow (NH_4)_2SO_4$

Insufficient ammonia can lead to the formation of ammonium hydrosulfates.

$H_2SO_4 + NH_3 \rightarrow NH_4NSO_4$

$SO_3 + H_2O + NH_3 \rightarrow NH_4NSO_4$

Subsequent reactions show that when the waste is neutralized with ammonia, nitrogen fertilizer and Labsani ammonium salt are formed. These substances can be used in agriculture without hesitation.

It is known from the literature that Surfactants can be widely used in practically all areas of agriculture. Surfactants are especially useful in improving soil structure. Alkyl sulfates and alkylbenzenesulfonates are very effective in this regard. When they are used, the density of the soil decreases and the porosity increases. As a result, the soil is easier to cultivate. This produces the ammonium salt alkylbenzene sulfonate. Ammonium salt has a higher Surfactants property than a solution of alkali metal salts.

REFERENCES

I. Cox,M.F., In Detergents and Cleaners, a Handbook for Formulators, Lange, K.R. (Ed.) (1994) Hanser, Munich, p. 43 ff.

II. Kaler, E., In Detergents and Cleaners, a Handbook for Formulators, Lange, K.R. (Ed.) (1994) Hanser, Munich, p. 1 ff.

III. Rosen, M.J., Surfactants and Interfacial Phenomena (1978), Wiley, New York, p. 162 ff.

IV. Christ, T., Morgenthaler, W.W., and Pacholec, F., In Detergents and Cleaners, A Handbook for Formulators, Lange, K.R. (Ed.) (1994) Hanser, Munich, p. 132 ff.

V. 5. Raney, K.H., In Surfactant Requirements for Compact Powder Detergents, Showell, M.S. (Ed.) (1997) Marcel Dekker Publishers, New York, p. 241 ff.

VI. Ланге К.Р. Поверхностно- активные вещества синтез свойства анализ применение. Санкт – Петербург. Издательство «Профессия» 2005. 239 стр.