



Journal Website:
<https://theusajournals.com/index.php/ajast>

Copyright: Original
content from this work
may be used under the
terms of the creative
commons attributes
4.0 licence.



ON THE INFLUENCE OF SURFACE-ACTIVE SUBSTANCES ON THE TECHNOLOGICAL INDICATORS OF THE FLASHING PROCESS

Submission Date: March 06, 2023, **Accepted Date:** March 11, 2023,

Published Date: March 16, 2023

Crossref doi: <https://doi.org/10.37547/ajast/Volume03Issue03-02>

Baxri Safarov

Associate Professor Of The Department Of Oil Refining Technologies, Bukhara Engineering Technological Institute Republic Of Uzbekistan, Bukhara, Uzbekistan

Temirbek Naubeev

Cand. Chem. Sciences, Associate Professor, Head Of The Department "Technology Of Oil And Gas", Karakalpak State University Named After Bardak, Republic Of Uzbekistan, Nukus, Uzbekistan

Seydabullaev Batirbay Baxitbay O'g'li

Master Of The Department "Technology Of Oil And Gas", Karakalpak State University Named After Bardak, Uzbekistan

Kobul Hotamov

Lecturer At The Department Of Oil Refining Technology Bukhara Engineering Technological Instituti, Republic Of Uzbekistan, Bukhara, Uzbekistan

ABSTRACT

In this work, the results of experimental studies in surfactants on the completeness and rate of water separation in the preparation of colored preparations based on dibutyl phthalate and unsaturated polyester resin HPC 609-21M are obtained.

It was found that the water beating intensification process was carried out with unsaturated polyester resin HPC 609-21M.

KEYWORDS

Flashing process, pigment, composition, surface tension, mixer, dispersion.

INTRODUCTION

One of the main methods for the industrial production of coloring preparations based on resins and plasticizers used for dyeing polymeric materials is the flushing process (water breaking), which allows direct transfer of pigments from an aqueous medium into an organic binder medium, bypassing intermediate drying and grinding. At the same time, a high dispersion of primary particles in the finished composition is maintained.

It is known that the flashing process is based on the phase transition of the pigment from the aqueous phase to the organic binder under the following condition: $\sigma_{p.v} > \sigma_{p.o.s}$ _ where $\sigma_{a.c}$ - surface tension at the pigment-water interface, $\sigma_{p.o.s}$ - surface tension at the pigment-organic binder interface [1].

To change the interfacial interaction, surfactants are used, which are introduced for this purpose into the process of pigment synthesis, at the last stage of washing them from water-soluble salts, or in the process of flushing [2].

The purpose of our work was to identify the degree of influence of a number of surfactants introduced into

the aqueous pigment paste on the completeness and rate of water separation in the preparation of colored preparations based on dibutyl phthalate and unsaturated polyester resin NPS 609-21M.

Since the question of the nature of the most effective surfactants used in the flushing process is not entirely clear in the literature [3, 4], we turned to surfactants of various types.

Fatty acid monoethanolamides , lauryl pyridinium sulfate (LPS), triethanolamine salt of lauryl sulfate (TEASLS).

Zh , inorganic pigment titanium dioxide (rutile) were studied as organic dyes .

The listed dyes in the form of aqueous pastes were homogenized in a Werner-Pfleider type laboratory mixer (Fig. 1) in the presence of surfactants in an amount of 1-2.0 wt . % of the dye at a temperature of 25 ° for 30 minutes (depending on the reaction of the aqueous dye paste with a 25% solution of ammonia or acetic acid, the pH value of the reaction medium was set in the range of 6.5-7.5).



Fig-1. General view of the Warner -P Flyder type mixer.

The process of water beating successfully develops under the condition of complete wetting of the pigment particles with an organic binder and some excess of it up to the “saturation point”. Based on this premise, the amount of binder required to cut off water (in our case, dibutyl phthalate or unsaturated polyester resin NPS 609-21M) was determined similarly to oil absorption of I and II types. The oil absorption of the second kind is determined upon receipt of a drop-liquid system. The separated water was drained, the mixer was sealed, with a discharge of 200-400 mm Hg. Art. and heating up to 70-75° C by running hot water

into the jacket of the apparatus, the residual moisture was removed to the presence of its traces. The finished preparation was obtained by diluting a thick paste with a binder - in the case of dibutyl phthalate, to a pigment content of 40 wt. %, unsaturated polyester resin HPO 609-21M for organic dyes - 10 wt.%, for titanium dioxide 20 wt.%.

Analysis of the data obtained (Table 1) shows that the introduction of the considered surfactants at the stage of mixing aqueous pastes of vat dyes

Table 1

Indicators of the capacity of dyes by organic binder

Colors e le	Capacity (g /100r)
-------------	---------------------

	according to dibutylphthalate		no resin HPC 609-21M	
	I po d a	II po d a	I po d a	II po d a
Ky new Bordeaux	57	186	-	-
vat bright green	72	135	-	-
vat bright orange	-	-	64	177
Titanium dioxide (p junk)	-	-	43	64

with dibutyl phthalate or unsaturated polyester resin HPS 609-21M does not intensify the flushing process.

With the use of LPS in the case of titanium dioxide, the time of water distillation is reduced from 20 to 1.5 min with a decrease in residual moisture by almost a factor of 2 (from 20 to 11%).

For an unambiguous explanation of the observed picture, we determined the relative change in the nature of the surface of the dyes when modifying their surfactants by determining the wettability with water.

Under the conditions under consideration, not only did the formation of a chemisorption hydrophobic layer on the surface of the solid phase, which promotes flushing, occur, but in the case of the use of a bifunctional surfactant-TEASLS, some of the layer is observed. hydrophilization of organic dyes (tab.-2) According to the method described in the literature [5], we measured the impregnation time of 1 g of the powder of the initial vat dyes Bordeaux and bright green G and with the addition of surfactants in the same quantities as during the flashing process .

Table 2

The effect of surfactants on the completeness and rate of water separation in the production of colored preparations based on dibutyl phthalate and unsaturated polyester resin H P C 609-21M

Dye	Weight of ex product/weight of cyxoro anhydrous dye (g/g)	Amount of surfactant (g)			Specific consumption for separation water (r/100 g hard dye)	Technological indicators flushing process		
		PS	TEASLS	synthetic fatty acid		water	residual	process

					dibutyl - phthal a t	H P C 6 09-21M		
Vat	300/100	-	-	-	140	-	20	thirt
Bord	300/100	1	-	-	140	-	60	y
eaux	300/100	-	2	1	140	-	60	43
	300/100	-	-	-	140	-	20	40
								29
Vat	455/100	-	-	-	145	-	thir	
brigh	455/100	1	1	-	145	-	ty	36.6
t green -	455/100	-	-	-	145	1	thir	38.6
nyj _	455/100	-	-	1	145	48	ty	32.5
	455/100	-	-	-	145	1	thir	36
						60	ty	
						25		
Vat	280/100	-	-	-	-	50	10	10
brigh	280/100	1	-	-	-	5	18	10
t orange	280/100	-	2	-	-	5	18	16
chewy		-	-	-	-	4		
						2		
TiO ₂ -	180/100	1.					20	20
(p	180/100	5		-			1.5	elev
util)								en

Based on the data given in table. 3, it can be concluded that the selected surfactants in the indicated concentrations turned out to be effective scouring agents.

Table 3

Wetting time of dye powders with distilled water

Dye	Wetting time (min) 1g powder		
	Initial	Modification	Modified LPS
vat bright green	He see a readable the same	27	Not wetted
vat burgundy		40	To w e

Thus, the results obtained confirm that the presence of LPS macromolecules on the surface of polar rutile, which contributes to a decrease in the polarity of TiO_2 , led to a significant intensification of water beating by unsaturated polyester resin HPS 609-21M.

REFERENCES

1. О.В. Калиниченко, О.П.Шеляпин, В.И. Тихонов Исследование поверх-ностно активных веществ на технологические показатели химического процесса Изд. «Химия», М.(1971) 212-217 стр.
2. Сафаров Б.Ж., Элов И.И. Анализ особенностей фазового равновесия между газом и абсорбентом. Наука, техника и образование. Научно-методический журнал. Москва, 2016. №2 (20). С. 33-36.
3. Сафаров Б.Ж., Наубеев Т.Х. Получение растворов сополимеров сульфатной целлюлозы с поливинилацетатом в смесях диметилформамида и четырехокси азота. Universum: технические науки: научный журнал. – № 7(88). Часть 2. М., Изд. «МЦНО», 2021. 45-47 с.
4. Safarov B.J., Mambetsheripova A.A. Sulphation Of N-Alkyl Anilines With Oleum The American Journal of Engineering and Technology. Published: November 21, 2021 | Pages: 1-10.
5. Поверхностно-активные вещества. Справочник под ред. А. А. Амбразона, Г. М. Гаевого. Изд. «Химия», Л. (1979).
- 6.