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WASTE PRODUCED IN THE PRODUCTION OF CHEMICAL ADDITIVES FOR PAINT PIGMENTS

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Abstract: *The article provides information on hazardous waste generated during the production of chemical compounds required for the production of paints for light industry.*

Key words: *Light industry, paint, ester, reactor, plasticizer, titanium oxide, plasticizer.*

Introduction

A complex ether (reactor) is used as a chemical additive to obtain light industrial paints. The following products are needed for the preparation of complex ether (reactor). Ethoxylate alcohol 8%, alkanesulfonates 7%, sulfosuccinates 9%, LABSA 4%, phosphonates 7.5%, copolymer acrylic and minor ionic acid 9%, homopolymer acrylic acids 7%, gluconates 6%, DTMRT 5%, oil 6%, amine ethoxylates 8%, naphthalene sulfonate 6%, organic acid and their salts 13%, acid complex fatty ether, siloxanes and silicones, ammonium salt, copolymer acrylic 4.5%. The above mixtures are mixed in universal reactors. The production capacity of complex ether for one day is 1500 kg/day. The annual capacity is as follows:

K = 10000 * 300 *0,8 = 2400 t/year

In the preparation of the compound ether, the pigments are mixed in a mixer at 1450 rpm until a single mass is formed. After the mixture reaches a uniform mass, it is sent to the pearl mill for dispersing the pigment paste. Then the mixture and solvents are added to the mixer and mixed until a mass is formed.

During the preparation of compound ether (reactor), acetone, benzene, butyl acetate, hydrocarbon, amyl acetate, propanol, xylene, methanol, ethyl acetate, ethylbenzene are released into the atmosphere. Pollutants are released into the atmosphere with the help of a ventilation pipe and cleaning equipment.

Chemicals needed to prepare 15% emollient mixture and bleach: isopropyl alcohol, monoethylene glycol, butyl diglycol ethyl, silicate oils, hydrogenated corn oil, acetaldehyde, emulsifiers,

hydrogen peroxide, glycerin, ethoxyl alcohols, paraffin, polyethylene, aminoethylene, ethanol amine, diethanol amine, chlorine ammonium, phosphates, ammonium sulfate, formaldehyde.

To prepare the softener mixture and bleach, the above additives are mixed in a mixing pot with a specified percentage in a pot with a capacity of 3 tons/day. An annual capacity of 600 tons of softener and 1800 tons of bleaching products is produced.

As the prepared product is hot, it is cooled using a cooling compressor. A steam and oil generator, a cooling network of a cooling tower, a water ionization production network, a compressor, and a generator are used in the technological process.

Pollutants formed in these processes are discharged into the atmosphere through the purification equipment of butyl acetate, butyl alcohol, ethyl alcohol, and toluene.

Chemicals used in the preparation of detergents: acrylic, hydroxide, ethoxyl alcohols,phosphonates, ammonium sulfate, labsa, butyl diglycol, isopropyl alcohol, polyethylene glycol, sulfuric acid, phosphoric acid, magnesium chloride, carbonate, hydrogen peroxide, sulfates.These compounds are mixed in the specified amount in the mixing pot. Washing products 2300 kg/day, annual amount 1382 t/year.

The preparation of washing products consists of a suspension of aqueous emulsion paints with pigments, fillers and water-dispersed film-forming substances, a mixture of emulsifiers, dispersants and other auxiliary additives. It is planned to install 3 complete sets of emulsion production equipment manufactured in Turkey for the production of washing products.

The following are installed in the laboratory. Drying cabinet, pH meter, conductometer, laboratory stirrer, dyeing machine, F350 Ataç Fulad, color cabinet, suction cabinet, Heat resistance testing device, measuring equipment.

Raw material products, which need to prepare a complex ether (reactor) for the reaction of the product, are brought to the enterprise ready-made. Products for ether preparation consist of the following components:

1)Film-forming substances: substances such as polycondensation resin, polymerization resin, natural resin, cellulose ether, vegetable oil, fatty acids of vegetable and melted oils, synthetic fatty acids;

2)Pigments: inorganic - white (titanium dioxide, zinc oxide, lithopone, etc.), yellow (ochre, lead and zinc crown, etc.), red (iron oxides, iron suric, mummy, orange crown and others), blue (iron azure, ultramarine and others), green (chromium oxide, medyanka and others); organic - (azo- and dnazopigments, phthalocyanine, anthraquinone, etc.);

3)Fillers: (barite, mel, talc, mica, etc.);

4)Plasticizers: (castor oil, acid esters - phthalate, phosphate, manganese, cobalt, etc.)

5) Diluents: (hydrocarbons, ketones, alcohols, ethers, etc.);

6)Sicatives (paint drying agents): lead, manganese, cobalt, naphthenates, linoleates, resinates (acidol, petroleum soap, naphthenic acid, salts and lead, manganese, cobalt oxides and others);

7) Additives: initiators, hardeners, accelerators, stabilizers, emulsifiers, etc.

The properties of paint products vary depending on the quantity and quality of the components.

The paint consists of a suspension of titanium dioxide and other apigmen, a filler mixed with pentatalum varnish. The table below shows the composition % of raw materials used for the production of PF type oil paint.

1.Table

Products used for the production of PF type oil paint

ubstance name	White color	The air is colored	Gray color	Red color
Half-finished pentaphthalate varnish	28	26	20	85,3
Titanium dioxide	62	60	75	-
Zinc alloy	-	6	-	-
Technical carbon	-	-	0,5	
Iron azure	-	4	-	
Red pigment	-	-	-	10,7
Total: %	100	100	100	100

A total of 500 tons of oil paint is produced in the paint production workshop in one year. If this amount of oil paint is conditionally produced in 4 different colors, 125 tons of each color will be produced. Taking these into account, the consumption of raw materials will be as follows.

2.Table

Raw materials for paint production

Substance name	White color, 125 t	The air is colored, 125 t	Gray color, 125 t	Brown in color, 125 t	Total, kg
Half-finished pentaphthalate varnish, kg	3500	3250	2500	10662,5	19912,5
Titanium dioxide, kg	7750	7500	9375	-	24625
Zinc alloy, kg	-	750	-	-	750
Technical carbon, kg	-	-	62,5		62,5
Iron azure, kg	-	500	-		500
Red pigment, kg	-	-	-	1337,5	1337,5

These raw materials are brought to the enterprise ready. Raw materials are not produced on the territory of the enterprise.

In the preparation of the compound ether, the pigments are mixed in a mixer at 1450 ob/min until a single mass is formed. After the mixture reaches a uniform mass, it is sent to the pearl mill for dispersing the pigment paste. Then add driers and solvents to the mixer and mix until various masses are formed.

The complex ether is used for painting metal and wooden products inside and outside. It is often used as a finishing material in construction.

As a result of the preparation of complex ether in the workshop, it is observed that harmful substances such as Acetone, Benzene, Butylacetate, Hydrocarbon, Amylacetate, Propanol, Xylene, Methanol, Ethylacetate, Ethylbenzene are released into the atmosphere through the ventilation chimney.

Production of bleaching washing products: aqueous emulsion paints consist of a suspension of pigments, fillers and water-dispersed film-forming substances, a mixture of emulsifier, dispersant and other auxiliary additives. It is planned to install 3 complete sets of emulsion production equipment manufactured in Turkey for the production of washing products.

By use, washing products are produced for light industry products.

Whitening detergents contain a film-forming substance, pigments, fillers, water, auxiliary functional substances (dispersant, emulsifier, stabilizer, thickener, anti-foaming agent (penogasitel), antiseptic, corrosion inhibitors) and additives (hydrophobic, structuring, coalescing, etc.) are included.

The film is divided according to the type of substances as follows:

- with polyvinyl acetate (VA) - containing polyvinyl acetate dispersion;
- vinylacetate copolymer (VS) - containing vinylacetate copolymer and dibutylmaleinate or ethylene aqueous dispersion;
- butadiene-styrene (KCh) - SKS-65GP latex composition, in the form of butadiene and styrene copolymer;
- acrylate (AK) - acrylate copolymer with dispersed composition;
- a mixture of vinyl chloride copolymer with vinyl chloride (XV) and vinylidine chloride and butadiene-styrene latex composition.

Pigments and fillers - inorganic pigments consist of anatase and rutile titanium dioxide, lithopone, strontium and lead crowns, ultramarine, chromium oxide, metal oxides.

Materials such as lead, zinc, iron lazuli are not used during production. It is not intended to use these substances because they are toxic, can damage alkalis, and release iron oxide.

40% of the composition of the emulsion is water. Because the film-forming substance also contains water. Water is also added to bring the aqueous emulsion to the required liquid. For the production of aqueous emulsion, it is recommended to use condensed, distilled or demineralized water. To reduce the water hardness, it is passed between two sodium cation filters and the hardness is brought to 3 meq/l. The process of reducing water hardness lasts for 1.5-2 hours.

Auxiliary substances and additives - dispersants for auxiliary substances (this substance softens pigments and additives, serves to mix them well in a liquid environment), protective colloid (polyvinyl alcohol serves as a protective colloid, this alcohol makes polyvinyl acetate coatings water-soluble 'serves to reduce conductivity'), emulsifiers (emulsifiers include fatty acid salts and highly active substances.

These substances serve to improve film formation in aqueous emulsions), stabilizers, thickeners, antiseptics, antifoaming agents, structuring agents, corrosion inhibitors, antifreezes.

During these processes, butyl acetate, butyl alcohol, ethyl alcohol, and toluene are released into the environment.

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