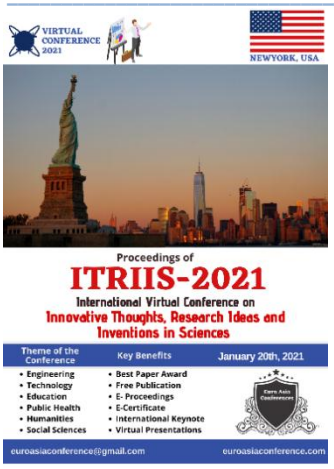

SUPERCONCENTRATES FOR POLYMERS

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Abstract:

This article covers the development and development of superconcentrates for polymers and their types, properties, and theoretical foundations.

Key words:

Polymer, superconcentrate, concentrate, antistat, antioxidant, masterbatch.

Polymer superconcentrates (Masterbatch) are currently being developed by Global Colors. Masterbatches are used as an easy and cost-effective way to add special additives to plastics, which facilitate processing during the manufacturing process or give different properties to the finished product. They contain modifiers or excellent dispersions for polymers in the proportions corresponding to the required recipe, additives and properties of the finished product. In addition to pure concentrates, multifunctional masterbatches for polymers can be used. Combinations of these colorants and additives have the ability to control the colostrum, taking into account the prescribed dose, to ensure the required amount of colorants in the supplemental dose.

Superconcentrates used to control the friction coefficient of film products. The following types of superconcentrates are: anti-blocker superconcentrate; adjacent superconcentrates (masterbatches); combined superconcentrates (masterbatches); antistatic superconcentrates; processing (extrusion) additives; superconcentrate antioxidant; dryer masterbatcher for polymers; antipyrene superconcentrates for polymers; Sustainable superconcentrates for UV rays; wear-resistant superconcentrates for polymers.

1. Anti-blocking superconcentrates for polymers.

Anti-blocking superconcentrates are mainly used as an adjunct in the extrusion of films and sheets from polyolefins to prevent them from sticking to each other. Closing can be done during the production of the film, as well as in tightly wrapped rolls or during storage of wrapped products. In addition, the introductory properties of some polymers may be the cause of adhesion. Due to the fact that the temperature of the film is higher than the ambient temperature during the wrapping of the film in the device, the film can penetrate and thus create a vacuum between the layers.

When the anti-block is added, micro-bumps appear on the surface of the material, which reduces the impact surface of the film, and at the same time reduces the adhesive ability. In addition, the use of anti-block improves the quality of bonding, sealing and printing of the film.

2. Allergic superconcentrates for polymers (masterbatch).

Subsidiary superconcentrates are a traditional material for reducing the coefficient of friction (counterpartial efficiency) of polyolefin films for the packaging of dry and liquid materials. If the film requires bonding or printing, the use of combined attachments is They are also used as a technological additive to improve the processing of polymeric materials. For example, PBPE, YUBPE, PP. Dosage - 1-2%. recommended.

3.Combined superconcentrates (masterbatch).

The balanced system provides a high level of locking and shifting. Additives are designed to control the properties of polyethylene film used for dairy packaging. They increase the quality and durability of welded seams of polyethylene film width. Reduces the coefficient of friction of the film. Improves the gloss and brightness of the film. It is also used as a technological additive to improve material processing. For example, PBPE, YuBPE, PP. Dosage - 1-2%.

4.Antistatic superconcentrates.

The development of polymeric materials and the rapid application of technology in practice have allowed them to demonstrate their remarkable properties in the field of electrical insulation. In this case, as a result of surface resistance - up to 1017 Ohms, an electrostatic charge is generated on the surface of the polymer material. Such charges can cause a variety of problems. The resulting spark may ignite flammable gases, dust, or liquid.

Due to the use of antistatic agents, the surface resistance can be reduced to 109 Ohms depending on the type of polymer and the active material, thereby preventing the formation of electrostatic charges.

The most common antistatic agents are hydrophilic (moisture-loving) and hydrophobic (moisture-repellent). Once these have moved to the surface of the polymer material, the hydrophobic part provides stability in the polymer material, while the hydrophilic part differs from the hydrophilic part in that it draws moisture from the air and thereby relieves stress. Therefore, the large amount of moisture in the air ensures that the effectiveness of antistatics is high. The maximum antistatic effect appears 3-6 days after the product is ready. Prolonged and improper storage of hygroscopic antistatic concentrates can lead to moisture absorption. In such cases, it is recommended to dry the masterbatch before processing. Antistatic agents have lubricating properties, which reduce the viscosity of the polymer solution and facilitate the removal of materials from the mold. If the processing temperature is too high, most of the substances evaporate and the antistatic effect is immediately impaired. In many cases, the weldability of the finished product is reduced. In this case, it is recommended to use anti-blocking additives or use a special tool such as a crown charger. The maximum amount for films in contact with food is 4%. The standard amount is 1.0 - 2.0%.

5.Processing (extrusion) additives.

Processing additives (lubricants) are developed on the basis of fluoropolymers and fluorolastomers and are used to improve the appearance of products, simplify technological processing and increase equipment productivity.

The widespread use of fluorine-based extrusion additives began with the production of linear polyethylene films for the extrusion process. One of the main reasons for the use of linear polyethylene is the increase in the efficiency of extrusion equipment and the improvement of the mechanical properties of polyethylene. Because fluorine polymers are more metal-like than polyethylene, they form a layer on the inside of the extruder and on the filler (comparable to a Teflon coating).

The effect of this layer is that the polymer solution no longer comes into contact with the metal, which reduces the difference between the velocities within the solution and in turn prevents the solutions from decomposing and increases the operating efficiency of the device.

6.Superconcentrate-antioxidant.

Superconcentrate-antioxidant is used in the production of plastic products (PBPE and PP products) from secondary polymer raw materials only in cases of improved thermal stability. The inclusion of antioxidant additives in the polymer allows to inhibit the thermoxidation process and improve the processing process (stabilizes the homogeneity of the rheological properties of the solution, ensures the homogeneity of the polymer solution), preserves the physical and mechanical properties of the material (including for films).

The use of antioxidants, especially in combination with light stabilizers, can also increase the service life of plastic products when exposed to the environment. Depending on the degree of decomposition of the secondary plastic and its composition in the primary mixture, the input share of SKGP-001 AO11 for different plastics is 1-5%.

7.Drying superconcentrates for polymers.

Drying superconcentrates are used to absorb moisture from plastic materials in the manufacture of products from secondary polymer raw materials. Superconcentrates allow moisture to be dried even from the granular composition (in which case the raw material is not suitable for conventional drying methods). For example, DC 500 superconcentrate is used effectively in the following cases:

- in case of excess moisture of polymer raw materials;
- when using secondary raw materials;
- Lack of drying equipment or in order to save electricity.

8.Flame retardant superconcentrates for polymers.

Flame retardants are used to increase the fire resistance of polymers and can slow the spread of flame. The field of application of plastics, for example, construction, transport, electrical engineering, electronics, etc., requires the inclusion of flame retardants in materials. Flame retardants should be added with more fire retardants compared to antioxidants, light stabilizers, antistatic agents, and other additives.

9.Ultraviolet resistant superconcentrates.

Any products made of polymeric materials (high-pressure film, plastic products) are exposed to heat, sunlight and oxygen, which leads to their destruction, ie the loss of specific mechanical and physical properties. One of the main causes of the decomposition process of polymer macromolecules is ultraviolet (UV) radiation from the sun. Initiates and accelerates fission and irreversible chemical reactions in the polymer structure. This not only changes the appearance, but also adversely affects the mechanical and physical properties. Due to the absorption of oxygen, the molecular structure of the polymer changes, which leads to normal, aging: cracking, migration, discoloration, and changes in mechanical properties.

To date, the most effective light stabilizers are HALS type stabilizers. The introduction of 1.0-3.0% (depending on the thickness) of this superconcentrate in the production of polyolefin films ensures that they are protected from sunlight for 3 seasons.

10.Cleaning superconcentrates for polymers.

Pressure casting machine for processing YuBPE, PBPE, PP, PVC raw materials, superconcentrates for cleaning extruders are designed to clean carbon cylinders formed during the processing of material cylinders and screw walls (especially in the processing of secondary materials).

The use of concentrate for cleaning machines does not cause abrasive effects and corrosion, eliminates the complex and time-consuming process of disassembling equipment and mechanically cleaning them, and saves plastics used for machine washing.

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