

## COMPLEX USE OF SECONDARY POLYMER WASTE

**Azizkulov Ravshanbek Jobir ugli**

Master of Karshi Institute of Engineering Economics

**Lutfullayev Sa'dulla Shukurovich**

Associate Professor of Karshi Institute of Engineering and Economics

**Nazarov Feruz Farkhodovich**

Lecturer of Karshi Institute of Engineering and Economics

[feruz-nazarov-88@mail.ru](mailto:feruz-nazarov-88@mail.ru)

### ABSTRACT

*Structural stabilization of polyolefins under the influence of ultraviolet light is usually achieved through the use of mixtures of (blocked amine stabilizers) BAS fillers.*

**Keywords:** Brittle, ethylene, propylene, technical, polymer, molecular, homopolymer, acetic acid

### АННОТАЦИЯ

*Стабилизация полиолефинов под действием ультрафиолета обычно достигается за счет использования смесей наполнителей (блокированные аминовые стабилизаторы) БАСС.*

**Ключевые слова:** Хрупкие, этиленовые, пропиленовые, технические, полимерные, молекулярные, гомополимерные, уксуснокислые.

### INTRODUCTION

Improving the physical properties by combining two different materials has always been an attractive technique, and this has led to the widespread use of compounds that act as analogues of the polymer metal alloy. Most polymer compounds are heterogeneous, consisting of discrete regions of one phase introduced from the second phase into the matrix. Homogeneous compounds are less well known due to the natural incompatibility of different polymers. Compatibility is improved by strong interaction between chains; for example, polar polymers such as PVX tend to form homogeneous compounds with other polar polymers, and we owe the availability of the required products. From a commercial point of view, the ability to both improve physical properties and control them by mixing polymer materials has been a significant achievement. The introduction of a small amount of rubber into the brittle matrix improves the fracture resistance by effectively blocking the spreading cracks [4]. Examples of high-impact PS and ABS are those formed by copolymerization in the presence of rubber latex. Another example is a mixture of

polypropylene with ethylene propylene rubber (EPR), which is produced by mechanical mixing or sequential polymerization of alcoholic polymers. The introduction of EPDM significantly increases the impact strength, which allows the use of PP homopolymer in applications such as the production of car bumpers, where this parameter is very important [5].

While proper mixing can help produce products with improved properties, it requires careful design and morphological control. Uncontrolled mixing usually results in poor mechanical properties. In addition, the processing of mixtures is by nature more difficult. The role of mixtures can be expected to increase due to the need for materials with better technical properties, but the process of distributing them is limited by processing difficulties [6].

## **DISCUSSION AND RESULTS**

Mixing of polymers is also an important aspect in many recycling technologies, as it avoids the problem of separating waste polymer mixtures into pure fractions and instead recycles the mixed batches without adding or adding “compatibility” [4]. Here it is appropriate to ask the question of how the basic degradation mechanisms change in the presence of two polymers [7].

Obviously, the degradation should be expected to depend on the decomposition mechanisms of both components and the morphology of the mixture. The degree of interaction of the two polymers in the mixture depends on whether they are located in separate regions or dissolved in each other and the formation of mobile products in one of the phases, which can lead to the destruction of the heterogeneous system. passes to another phase through the interfacial boundary. The independent degradation that occurs in polymer mixtures alters its behavior if the degradation involves small mobile particles. This is especially true of PVX-based compounds, the destruction of which can form chemically active and highly mobile Cl atoms and HCl molecules that can react with another component of the mixture, which can increase or slow down the destruction [8].

A good illustration is a mixture of PVX with PMMA, which can be heterogeneous or homogeneous depending on the composition and temperature. Braun showed that both components of conventional compounds are more stable than their homopolymers due to the interactions of degradation products. Chlorine atoms, which are intermediate in the formation of HCl, are captured by the PMMA, causing the chain to break down. However, HCl stabilizes PMMA by reacting with ether to form anhydride rings that act as chain break-blocking groups. The slower

decomposition of heterogeneous mixtures suggests that it depends on morphology. In a homogeneous material, PVX decomposition products can easily come into contact with PMMA chains, while in a heterogeneous sample, they must first be distributed through the interface, which slows down the process. The opposite effect is observed in mixtures of PVX and polyvinyl acetate (PVA) [6]. Mixing in this system leads to significant destabilization of the PVX. The passage of NS from PVX along the PVA boundary leads to the acid-catalytic formation of acetic acid; it, in turn, can spread backwards, leading to a new loss of HCl. Adverse effects on PVX are also observed in mixtures with PS [9].

A major problem associated with the recycling of mixed packaging waste is the negative impact of PVX on the stability of polyesters, especially PET. This is because the very high temperature (typically  $> 300^{\circ}\text{C}$ ) required to process PVX leads to rapid hydrochlorination of PVX, which catalyzes the decomposition of PET, especially in the presence of water [10]. If one of the components of the mixture is a diene polymer, the disruption of the rubber phase can lead to a rapid loss of hardness, as the high refractive energy of the polymer depends on its ability to absorb energy. rubber phase and this ability decreases rapidly with oxidative cross-linking. However, oxidation of the rubber phase may stimulate subsequent destruction of the matrix phase [7]. The complex motion of the mixture is enhanced by the presence of stabilizers, as they have different solubility and migration rates at different stages. Especially in high-performance polymer mixtures, it can be assumed that the rubber separates in favor of the phase. There is very little literature on the action of additional chemicals in mixtures[11].

Found that thiodipropionate and phosphite additives mainly transition to the rubber phase in ABS plastics, and that high temperature stability is related to the localization of the additive in the unstable rubber phase or its ability to spread between phases. its consumption in rubber. Showed preferential isolation of the amine light stabilizer into the rubber phase in a styrene / SAN mixture with butadiene [3].

Showed that the weight of PVC T was reduced at concentrations below 0.5% due to the plasticizing effect of organotin stabilizer. By measuring the Tg change of the PVC phase in the PVC / SAN mixture, they found the separation of the auxiliary phases, but the separation did not affect the thermal stability of the PVC, as shown by measuring the hydrochlorization rate at  $180^{\circ}\text{C}$ . They conclude that the interface dissipates quickly enough at this temperature to cover any flow in the PVC at room temperature, where SAN is a glass copolymer, the result can be expected to be

different. The effect increases with temperature, so most of the additive is at this stage at the production temperature [12]. Calculations have shown that chemical additives can spread rapidly between phases to somehow cover consumption at operating temperature. At processing temperatures, the diffusion of the antioxidant from the stable rubber phase to the polypropylene may be slow enough to limit oxidation protection. Recently, Lazar and Billingham showed that stabilizing additives in poly (ether-b-ether) type copolymers are almost completely soluble in the soft polyester phase, but not in hard polyester blocks. However, the significance of this division is still not understood.

### CONCLUSION

Many believe that plastics are infinitely stable and will pollute the environment forever. This is far from the truth. A great achievement of chemical science and technology is the export of polymeric materials from laboratories to the world market, realizing the limits of their destruction in the production process and in the form of finished products.

Although plastics are highly stable and can significantly save pollution, weight, and energy costs, their production remains under constant pressure from recycling technologies. While the recycling of energy and small molecular weight products plays an important role, if the separation of raw materials can be achieved, recycling for reuse will definitely become the mainstream. The attractiveness of the recycled polymer waste mix is less clear, although it needs to find its place in the market.

### REFERENCES.

1. Технология резины: Рецептуростроение и испытания/ под ред. Дика
2. Пер. с англ. под ред. Шершнева В.А.Спб: Научные основы и технологии, 2010. 620 с.
3. Якубов Э.Ш., Нахатов И., Норматов Б.Р.Координационные соединения меди(II) с хиразолоном-4 и его производными. // Узб. хим. журн. – 2019. - № 4. – С. 44-51.
4. Самадов С.Ж. Назаров Ф.С. Бекназаров Э.М. Назаров Ф.Ф. Биологическая активность синтезированных соединений производных N, N- полиметилена бис [(но-ароматилло-циклоалканолоило) карбаматов]. Universum: технические науки. "Технические науки" 2021 3(84).
5. Самадов С.Ж. Назаров Ф.С. Бекназаров Э.М. Назаров Ф.Ф. Математическое описание технологических процессов и аппаратов. Universum: технические науки. "Технические науки" 2021 5(86).

- 
6. Назаров Ф.Ф. Назаров Ф.С. Шабарова У.Н. Файзуллаев Н.И. Пар-карбонатная конверсия метана. *Universum: технические науки. "Технические науки" 2021 6(87)*.
7. Якубов Э.Ш., Назаров Ф.С., Назаров Ф.Ф., Хамдамова Ч.Х., Ибрагимов К.И.У. // Комплексные соединения кобальта (II), меди (II) и цинка с 2-Метоксикарбониламинохиназолоном-4 // Наука, техника и образование//6 (59) 8-12.
8. Nazarov, F. F., & Nazarov, F. S. (2022). DISPLACED LIGAND COPPER (II) COMPLEXES WITH QUINAZOLONE-4 AND ITS DERIVATIVES. *Oriental renaissance: Innovative, educational, natural and social sciences*, 2(2), 841-846.
9. Назаров Ф.Ф., Назаров Ф.С., Якубов Э.Ш. Смещаннолигандные комплексы меди(II) с хиначолоном-4
10. Nazarov, F. F., & Nazarov, F. S. (2022). COORDINATION COMPOUNDS OF COPPER (II) AND ZINC With 2-AMINOQUINAZOLONE-4. *Oriental renaissance: Innovative, educational, natural and social sciences*, 2(Special Issue 4-2), 839-842.