IJIAET International Journal of Innovative Analyses and Emerging Technology

| e-ISSN: 2792-4025 | http://openaccessjournals.eu | Volume: 2 Issue: 4

The Effects of Mechanical Stress and Ultra Violet Light on Photochemical Process in Acetamide

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Abstract: the effect of preliminary UV irradiation with light with wavelengths λ1=254nm, λ2=313 nm and λ3=365 nm and mechanical tension on the tensile strength and molecular weight of acetamide.

It was revealed that the different manifestation of tensile load actions is associated with the peculiarities of photochemical reactions in qyinazolin-4-one depending on the temperature and the wavelength of UV light acting.

Keywords: ace amide, UV-light, photo destruction, strength, the molecular weight, tensile strength, photochemical reactions, depending on the temperature.

INTRODUCTION

Recently, there has been an intensive development of the chemistry of heterocyclic compounds, complexes of these compounds with various metals and their salts. This is due to the high physiological activity of this class of substance. Among them, plant growth [1], herbicides [2], fungicides [3], and the mantic preparations [4] were identified.

In this work, we carried out under the influence of visible and especially ultraviolet (UV) light, reactions of destruction and structuring of molecules develops in ace amide, as well as oxidative processes are activated. There is a rapid change in mechanical properties and the sample becomes brittle and turns intensely yellow [5]. At the same time, the mechanical characteristics of the polymer deteriorate and its service life decreases [6].

In ace amide, various photo physical and photochemical processes can occur under the action of light with different wavelengths. If direct photolysis can occur under the action of short-wave light, then under the action of long-wave UV-light, the destruction of ace amide it can occur under the action of impurities.

To clarify this factor, experiments were conducted in this work to study the dependence of the tensile strength of ace amide samples previously irradiated in air with light with wavelengths of 1=254 nm, 2=313 nm and 3=365 nm on the irradiation time.

The results of the experiments are given. As can be seen, the drop in the tensile strength of the samples occurs in all three cases; however, the drop in strength for samples irradiated with light occurs much faster than for samples irradiated with light. Ace amide it strongly absorbs UV radiation in the wave region below 290 nm. The drop in the strength of samples, especially when irradiated with a wavelength, is largely due to the presence of oxygen in the environment.

The deterioration of the operational properties of ace amide under the combined action of mechanical load and UV-light depends on the irradiation temperature and the magnitude of the applied voltage [7].

ISSN 2792-4025 (online), Published under Volume: 2 Issue: 4 in April-2022

THE EXPERIMENTAL PART

In this work, the course of photo destruction, in addition to the breaking strength, was also judged by the change in the molecular weight of ace amide temperature, it leads to a decrease in the molecular weight of the samples. In this case, the drop in the molecular weight of ace amide during irradiation depends on the magnitude of the mechanical stress. The drop in the molecular weight of ace amide irradiated under load at room temperature by UV-light with λ1, λ2 and λ3 is less than the drop in the molecular weight of samples irradiated in the Free State. That is, mechanical stress in these conditions slows down the development of the process of photo destruction.

The results obtained at the molecular level confirm the results of experiments on the effect of load on the change in the breaking strength of irradiated ace amide samples. As we mentioned above, the nature of the dependence of the drop in the molecular weight of samples depends on the irradiation temperature. If the irradiation of samples with UV light from λ1, λ2 and λ3 was carried out at a temperature of 60 °C, then the drop in the molecular weight of the loaded samples turned out to be greater than the drop in the molecular weight of the samples irradiated in the unloaded state. Under these conditions, unlike experiments at room temperature, the tensile load already noticeably accelerates the kinetics of photo destruction.

CONCLUSION

Thus, at room temperature in unloaded samples, along with the Norrish type I reaction, Norrish type II reactions are possible. Under these conditions, mechanical stress prevents the Norrish type II reaction from proceeding, thereby reducing the overall rate of ace amide photo-destruction. At a temperature of 60°C The main contribution in the process of photo destruction of PS is given by both Norrish type I reactions and photo oxidation reactions.

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ISSN 2792-4025 (online), Published under Volume: 2 Issue: 4 in April-2022