

Making Organic Adhesive from Pectin Heterosaccharide in the Structure of Flaxseed (*Linum usitatissimum*)

PROBLEM

The living body is under constant oxidative stress. Oxygen splits in the body into two atoms that do not have electrons in a binary state. However, electrons want to be in binary state. These molecules are important and necessary for cells to fulfill their functions. If these molecules are damaged and worn out, problems arise in the cell.

These problems; It causes diseases such as premature aging, cardiovascular diseases, cancer, Parkinson's disease, age-related weakening in the immune system.

METHOD

Before starting the experiment, necessary laboratory precautions were taken and pandemic rules were followed. boiling water

First, 600 ml of water was boiled. Adding flax seeds As in Picture 7.1, 100 g of ground flaxseed was added and boiled with stirring for 15 minutes. After the mixing process was stopped, boiling was continued for 3 minutes without being touched. Adding other materials

25 ml of cider vinegar and 5 ml of glycerine were added respectively and boiled for 3 more minutes. Filtering and packaging stage After the mixture is obtained, it is not filtered. After the glue formed is put into the tubes, it becomes ready for use.

SUMMARY

Adhesives are generally defined as substances that serve to join at least two materials together. It is known that chemical adhesives cause deterioration of the skin and respiratory system in humans, as well as cause permanent damage to the environment, and in this context, the use of solvent-based adhesives in schools and their sale to individuals under the age of 18 are prohibited by law. The aim of this project; is to create an alternative product to existing adhesives, which does not contain chemicals, is completely organic, is friendly to human health and the environment.

In this context, an adhesive has been developed by using the thickening ability of pectin heterosaccharide in the structure of flaxseed. In order to give flaxseed an effective adhesive ability, water, vinegar and glycerin were included in the content of the experimental setup. In tests and experiments, three types of adhesives were compared: solvent adhesive, water-based adhesive and new organic adhesive made with linseed (*Linum usitatissimum*) tests and comparisons were made. Tests performed are: harmful chemical content, drying time and adhesive strength tests.

It has been observed that the product obtained is not allergic in performance tests, adheres in the same time as water-based adhesives, and has an effective and strong bonding ability. The product obtained as a result of the current project work is an important alternative to the currently used adhesives that are harmful to the environment and human health due to the fact that the product obtained as a result of the current project work is economical, there will be no need for raw material imports in large-scale productions thanks to the use of own resources, it is suitable for the environment and human health, and does not create any additional production waste. is revealed.

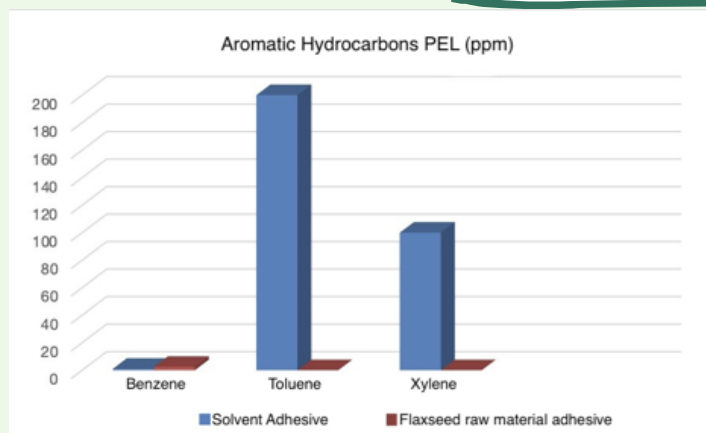
Keywords: Organic, Adhesive, Flax, Seed, Pectin.

CONCLUSION AND DISCUSSION

When the amount of flaxseed was reduced, the adhesive produced could not reach the targeted adhesive strength and consistency. The drying time of the adhesive made by adding baking soda has exceeded 15 minutes. The drying time of the adhesive made without the addition of glycerine exceeded 15 minutes, the targeted adhesive strength could not be reached and the usage time was shortened. The adhesive made by adding ground flaxseed could not reach the targeted bonding strength. Since the drying time, adhesive strength and consistency of the experiment valid in the project (Experiment 1) reached the targeted level, the comparisons were carried out on this experiment.

In this study, it has been seen that the adhesive consisting of flaxseed extract and other completely natural materials is more suitable for use for human health, despite the harms of solvent or water-based (all chemical content) adhesives. It is suitable for use by individuals of all ages in schools, homes, due to its easy transportation and production. Due to the antibacterial properties of the vinegar in its content, the deterioration period is extended. It can be used in schools because it does not deteriorate for a long time and is safe.

GRAPHICS



RESULTS

Experiment 1: 600 ml of water, 100 g of flaxseed, 25 ml of grape vinegar and 5 ml of glycerin were used; Adhesive with linseed raw material was obtained.

Experiment 2: 600 ml of water, 50 g of flaxseed, 25 ml of grape vinegar and 5 ml of glycerin were used; Adhesive with linseed raw material was obtained.

Experiment 3: 600 ml of water, 100 g of flaxseed, 25 ml of grape vinegar, 5 ml of glycerin and 5 g of baking soda were used; Adhesive with linseed raw material was obtained.

Experiment 4: 600 ml of water, 100 g of flaxseed and 25 ml of grape vinegar were used; Adhesive with linseed raw material was obtained.

Experiment 5: 600 ml of water, 100 g of ground flaxseed, 25 ml of grape vinegar and 5 ml of glycerin were used; Adhesive with linseed raw material was obtained.