

EXTRACTION OF PECTIN FROM POTATOES AND PEARS

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ABSTRACT

In this experiment we have shown how pectin can be extracted from cheap and economically viable sources such as peels of Potatoes and Pear peels of Potatoes are among the largest natural sources of Pectin. The purpose of this project is to find new sources of Pectin which can serve as alternative to current sources. The purpose of choosing pears and potato is its cheap availability. Also peels of Potatoes and Peers are considered to be useless and are often thrown or used for less productive purposes. The price of commercially available Pectin is also very high in India and other countries. This research will surely help in development of new and cheap methods for extraction of valuable Pectin from waste or useless sources. Pectin has many applications in food and pharmaceutical industries and in our day-to-day life.

Keywords: Pectin, Alternative, Cheap, Pears, Useless

1. INTRODUCTION

Pectin (derived from Greek meaning – —congealed and curdled) is a structural heteropolysaccharide contained in the primary cell walls of terrestrial plants^[1]. Potatoes are widely cultivated in India and are chief sources of starch for Indian people. Also pears are also widely consumed in India. Potatoes being widely used in industries which produce potato chips, snacks, junk food and packaged food products. These industries treat the potato peels as waste products and are often thrown in waste. This project will illustrate how can we turn waste into some useful products. Pectin are a class of complex polysaccharides found in the cell walls of higher plants, where they function as a hydrating agent and cementing material for the cellulosic network. It is widely used in dessert fillings, medicines, sweets and as a stabilizer in fruit juices and milk drinks and also a source of dietary fiber. It is also used to control high cholesterol, high triglycerides and to prevent colon cancer and prostate cancer. It is also used for diabetes and gastro esophageal reflux disease (GERD). Pectin is also used for treating poisoning caused by lead, strontium and other heavy metals.

Pectin is used in traditional high jam sugar and it is the most used application of pectin. Hydrogel from pectin is used in tablets formulated as binding agents which are used in controlled release matrix tablet formulation. In ice, pectin can be used to control ice crystal size in ice pops. Also, Pectin is widely used in pharmaceutical industries^[6]. Pectin is a solid powder, white in color and is soluble in pure water. Pectin is odorless and

mucilaginous. It is stable at ordinary conditions but is severely affected in excess heat. Pectin is soluble in pure water.

Pectin is present in citrus fruits such as lemon and oranges as well as in pears, plums, apples, potatoes and sweet potatoes but the sources of commercial production are very limited^[4].

In this project we've extracted pectin from potatoes and pears through simple and cheap laboratory processes

2. MATERIALS AND EQUIPMENTS

Potatoes, Pears, HCl, Ethanol, NaOH, Distilled water, Beaker, Burner, Stirring Rod, Test tubes.

3. PROCEDURE

Potatoes and Pears were brought from market. Peels of about 20.6 g of each Potato and 36g of Pears were taken out and cut in small pieces. The pieces of each of the fruits were put in separate beakers and 250 ml of 0.05 M HCl solution is added to them. The prepared mixture is boiled at 90 degree Celsius for about 30 minutes. The boiled mixture is constantly for about 5 min. Filtrate and residue are separated with the help of cotton cloth. 32% of NaOH is then added to filtrate for neutralization and same amount of 95% ethanol is then added to filtrate. The final mixture is kept in freezer at about 4 degree Celsius for 14 hours. Now a sticky substance was observed at the bottom of both the mixtures. It was carefully separated from the liquid mixture. The extracted pectin was purified by washing in 200 mL ethanol and then pressed on a nylon cloth to remove the residual HCl and universal salt. Now the Pectin was shredded off and dried in dry air^[3].

4. ANALYSIS

4.1 Qualitative Analysis

Presence of Pectin from extracted products is verified using following tests.

1. When the pectin powder was mixed with acidified alcohol i.e. the mixture of 95% ethanol and 37% HCl in small proportions, It gave flakes.

2. When mixed with 0.2M NaOH pectin gave Yellowish solution.

4.2 Quantitative Analysis

Weight of peel taken out from potato (W₁) = 20.6 g

Weight of Pectin obtained (W₂) = 3.5g

Therefore, Percentage yield of Pectin = $(W_2/W_1) * 100 = 16.99\%$ ^[5]

Similarly,

Weight of peel taken out from Pear (W₁) = 36g

Weight of Pectin obtained (W₂) = 3.9g

Therefore, Percentage yield of Pectin = $(W_2/W_1) * 100 = 10.8\%$



Potato peels being boiled



Pear solution



Potato Solution



Confirmatory Test with NaOH

5.CONCLUSION

In this experiment we have extracted Pectin from Potato and Pears. The main objective of this project is to show how commercially and medically valuable Pectin can be extracted from domestic and industrial waste such as peels of Potatoes and Pears.

6. BENEFITS

1. Waste recycled to useful product
2. Economically very profitable
3. Simple Procedure
4. Medically very useful.

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