NCON-PGR_2022_237

Drying and Pectin Extraction from Waste Lemon Peel (*Citrus Limon*) Using Extraction Process with Ultrasonic Waves

***Untung Hidayat*[1], *Tri Yuni Hendrawati*[2]*, *Budiyanto*[3], *Anwar Ilmar Ramadhan*[4] *and* *Wan Hamzah Azmi*[5]**

[1,2]Department of Chemical Engineering, Faculty of Engineering, Universitas Muhammadiyah Jakarta, Jl. Cempaka Putih Tengah 27, 10510 Jakarta, Indonesia.

[3]Department of Electrical Engineering, Faculty of Engineering, Universitas Muhammadiyah Jakarta, Jl. Cempaka Putih Tengah 27, 10510 Jakarta, Indonesia.

[4]Department of Mechanical Engineering, Faculty of Engineering, Universitas Muhammadiyah Jakarta, Jl. Cempaka Putih Tengah 27, 10510 Jakarta, Indonesia.

[5]Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, Pekan 26600, Pahang, Malaysia.

**Corresponding author*: yuni.hendrawati@umj.ac.id

Abstract.

Lemon (Citrus Limon) is one of the most widely processed horticultural products into lemon juice. Approximately 70% of the weight of the fruit in the lemon juice processing industry will be wasted (including the peel, seeds, pulp and remaining lemon juice). Lemon peel waste will be thrown away and cause environmental problems, even though lemon peel waste can still be processed as a source of pectin raw materials. The benefits of pectin most in food processing because of its ability to form a gel and a source of fiber in food. The purpose of this study was to obtain the drying yield with the best dehydrator and to optimize the extract time and the effect (pH) on the yield of the lemon peel waste extract. The method used is extraction with the help of ultrasonic waves with a wavelength of 40 kHz and the solvent is citric acid. Filtering of lemon peel waste extract using filter paper. This test was carried out with the length of the extraction time (20 minutes, 30 minutes, 40 minutes, 50 minutes) and with the pH (1.5, 2, 2.5). The drying process on waste of lemon peel aims to reduce the moisture content so that the material is more durable and avoids the growth of unwanted fungi and microorganisms. Yields of waste of lemon peel drying is 15.4 %. The results showed that the highest extract yield was 57% with treatment time of 40 minutes and pH 2, based on FTIR analysis, it showed the presence of pectin functional groups. The results of the proximate analysis of the lemon peel extract contains 1.50 % protein, 81.37 % carbohydrates, 0.17 % ash content, 3.87 Kcal/100 g energy from fat, 335.35 Kcal/100 g total energy.

Keywords: Citrus Limon; Extraction; Waste lemon peel; Pectin; Ultrasonic.