

Microwave and Ultrasound Assisted Extraction of Pectin from Mandarin and Lemon Peel: Comparisons between Sources and Methods

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Abstract : Pectin is a complex colloidal polysaccharide, found on the cell walls of all young plants such as fruit and vegetables. It acts as a thickening, stabilizing and gelling agent in foods. Pectin was extracted from mandarin and lemon peels using ultrasound and microwave assisted extraction methods to compare with these two different sources and methods of pectin production. In this work, the effect of microwave power (360, 600 W) and irradiation time (1, 2, 3 min) on the yield of extracted pectin from mandarin and lemon peels for microwave assisted extraction (MAE) were investigated. For ultrasound assisted extraction (UAE), parameters were determined as temperature (60, 75 °C) and sonication time (15, 30, 45 min) and hydrochloric acid (HCl) was used as an extracting agent for both extraction methods. The highest yields of extracted pectin from lemon peels were found to be 8.16 % (w/w) for 75 °C, 45 min by UAE and 8.58 % (w/w) for 360 W, 1 min by MAE. Additionally, the highest yields of extracted pectin from mandarin peels were found to be 11.29 % (w/w) for 75 °C, 45 min by UAE and 16.44 % (w/w) for 600 W, 1 min by MAE. The results showed that the use of microwave assisted extraction promoted a better yield when compared to the two extraction methods. On the other hand, according to the results of experiments, mandarin peels contain more pectin than lemon peels when the compared to the pectin product values of two sources. Therefore, these results suggested that MAE could be used as an efficient and rapid method for extraction of pectin and mandarin peels should be preferred as sources of pectin production compared to lemon peels.

Keywords : mandarin peel, lemon peel, pectin, ultrasound, microwave, extraction

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