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Thesis Advisory Committee : Asst.Prof.Dr. Ratchada Tangwongchai, Asst.Prof.Dr. Kasem Nantachai

ABSTRACT

In the study of pectin extraction from *Citrus medica* Linn., the screening experiment (2^{5-1} fractional factorial design) showed that pH, temperature, and extracted time were the main factors affecting the amount of extracted pectin whereas time did not affect the equivalent weight and methoxyl content ($p \leq 0.05$). Optimum condition of pectin extraction was studied using Central Composite Designs (CCD) showed that there were relations between factors of pH (X_1), temperature (X_2) and extracted time (X_3), giving the mathematics models as the following equations; The amount of extracted pectin (Y_1) = $10.104 - 4.89X_1 + 5.191X_2 + 1.848X_3 + 0.686X_2^2 - 2.068X_1X_2 + 1.917X_2X_3$ ($R^2 = 0.961$); Methoxyl content (Y_2) = $3.794 + 1.257X_1 - 0.255X_2 - 0.167X_3$ ($R^2 = 0.781$) and the anhydrogalacturonic acid content (Y_3) = $667 + 104.189X_1 - 30.039X_2 - 18.616X_3 - 51.252X_1X_2$ ($R^2 = 0.899$). The anhydrogalacturonic acid content had a low determination coefficient of ($R^2 = 0.27$) which was not suitable for modeling. However, the anhydrogalacturonic acid content was 66.5–91.8%, lying on the accepted limit of FAO (>65%). The validation of the model showed that the calculated value of the amount of extracted pectin, equivalent weight and methoxyl content were similar to those from the practical extraction at the same condition. Using the model, the studying condition of the lowest pH (1) and the highest temperature and extracted time has given the highest amount of extracted pectin while the opposite condition has given the highest in the methoxyl content and its equivalent weight. Using the both mathematics models of the amount of extracted pectin and methoxyl content, the condition of pH 2, temperature of 100°C and 105 min was used as the optimum condition for the pectin extraction, resulting in the extracted pectin of 33% yield, equivalent weight of 578, and methoxyl content of 2.5% (dry basis). The use of extracted pectin as a jelling agent in pineapple jam showed that the extracted pectin gave no significant difference in gel consistency compared to the commercial grade 150. However, the commercial pectin had a higher liking score on the spreadability, texture and overall liking. As a stabilizer in chocolate pasteurised milk, 0.2% of the extracted pectin was needed to prevent precipitate of chocolate powder with the similar viscosity to 0.06% carageenan.