

ABSTRAK

Nama : Kusmawan
Jurusan : Fisika
Judul : Identifikasi Sifat-Sifat Fisika dan Kimia Pati (*Starch*) dari Berbagai Macam Sumber (Singkong, Kentang, Beras, Ubi, Jagung dan Sukun)

Bioplastik dari bahan pati sangat potensial, karena negara Indonesia merupakan penghasil bahan alam untuk pati. Tujuan penelitian yaitu mengidentifikasi dan mengkomparasi sifat-sifat fisika serta kimia pati. Sumber bahan pati yang diolah meliputi: singkong, kentang, beras, ubi, jagung dan sukun. Penelitian meliputi proses isolasi dan karakterisasi pati. Proses isolasi dilakukan untuk memisahkan pati dari bahan. Karakterisasi yang dilakukan meliputi: uji densitas, SEM (*Scanning Electron Microscopy*), amilosa amilopektin, FTIR (*Fourier Transform Infrared*) dan DSC (*Differential Scanning Calorimetry*). Hasil proses isolasi menunjukkan nilai persentase berturut-turut dari yang tertinggi adalah pati beras (27,02%) sampai yang terendah yaitu pati jagung (0,67%). Sementara itu, hasil dari uji densitas, SEM dan DSC terhadap pati singkong, pati kentang, pati beras, pati ubi, pati jagung dan pati sukun berturut-turut: densitas (1.57, 1.63, 1.47, 1.55, 1.61, 1.47) g/ml, SEM (11.11, 18.1, 5.43, 10.73, 6.33, 6.14) μm serta DSC (87.9, 71.2, 79.8, 60.6, 88.2, 69.9) $^{\circ}\text{C}$. Hasil identifikasi dari kadar amilosa amilopektin pati berturut-turut: amilosa (38.5, 54.3, 29.8, 39.0, 27.5, 36.4)% dan amilopektin (50.9, 36.1, 52.6, 48.8, 24.3, 51.2)%. Identifikasi FTIR menunjukkan bahwa keenam jenis pati memiliki gugus fungsi yang sama, diantaranya: O-H alkohol, C-H alkana, C-O amida, C-O ester, C=C alkena dan $(\text{CH})_2\text{n}$. Hasil analisis sifat fisika dan kimia pati menunjukkan keterkaitan antara satu sifat dengan sifat lainnya.

Kata kunci : pati, densitas, granula, amilosa, amilopektin, gugus fungsi, gelatinisasi

ABSTRACT

Name : Kusmawan

Majors : Physic

Title : Identification of Physic and Chemistry Characteristic in
Starch from Various Resource (Cassava, Potato, Rice, Sweet Potato,
Corn, and Breadfruit)

Bioplastic from starch material is very potensial, because Indonesia is producer for natural material of starch. This research is aimed to identifying and comparing the physic and the chemistry characteristic of starch. Resources of starch materials which be processed are: cassava, potato, rice, sweet potato, corn, and breadfruit. The research included isolation process and starch characterization. Isolation process done to separate the starch from the material. In starch characterization process include: density test, SEM (Scanning Electron Microscopy), amilosa amilopektin, FTIR (Fourier Transform Infrared) and DSC (Differential Scanning Calorimetry). Isolation process results showed that starch from rice got the highest percentage (27,02%) and the lowest percentage was starch from corn (0,67%). Meanwhile, density test result, SEM and DSC of starches from cassava, potato, rice, sweet potato, corn, and breadfruit, consecutively: density (1.57, 1.63, 1.47, 1.55, 1.61, 1.47) g/ml, SEM (11.11, 18.1, 5.43, 10.73, 6.33, 6.14) μm and DSC (87.9, 71.2, 79.8 60.6, 88.2, 69.9) $^{\circ}\text{C}$. Identification result of amylose amylopectin levels from the starches, consecutively: amylose (38.5, 54.3, 29.8, 39.0, 27.5, 36.4)% and amylopestin (50.9, 36.1, 52.6, 48.8, 24.3, 51.2)%. FTIR identification showed that the six starch types have the same functional groups, specifically: O-H alcohols, C-H alkanes, C-O amides, C-O esters, C = C alkenes and $-(\text{CH})_2\text{n}$. Physic and chemistry analysis result showed correlation between one characteristic with another characteristics.

Key words : starch, density, granules, amylose, amylopectin, functional groups, gelatinization