POTENSI BIOMASSA ALGA SEBAGAI SUMBER SELULOSA DAN NANOSELULOSA

SKRIPSI

diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains
dalam bidang Kimia

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PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul **"POTENSI BIOMASSA ALGA SEBAGAI SUMBER SELULOSA DAN NANOSELULOSA"** ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, Januari 2021
Yang membuat pernyataan,

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ABSTRAK

Tujuan dari penelitian ini adalah untuk melakukan *review* artikel terkait potensi biomassa alga yang meliputi jumlah perolehan selulosa dan karakteristiknya sebagai sumber selulosa dan nanoselulosa serta melihat pengaruh kondisi hidrolisis terhadap karakteristik NCC (nanokristal selulosa). Metode yang digunakan pada penelitian ini berdasarkan studi literatur dengan model *systematic review* dimana data yang digunakan untuk dianalisis berupa data sekunder yang bersumber dari berbagai literatur yang diseleksi secara sistematis sesuai topik bahasan yang terkait. Tahapan studi literatur dimulai dengan melakukan pencarian artikel melalui berbagai *database online* dengan memasukan kata kunci yakni *Algae, Cellulose, Nanocellulose,* dan *Nanocrystalcellulose,* yang kemudian artikel dilakukan beberapa tahapan seleksi berdasarkan jenis literatur (artikel penelitian), sumber biomassa (alga), material yang dihasilkan (selulosa/ nanoselulosa) dan kecocokan data penelitian dengan apa yang akan dibahas. Jumlah literatur yang digunakan sebagai jurnal rujukan utama sebanyak 20 artikel dalam rentang waktu 10 tahun terakhir yang mencakup 19 spesies makroalga. Hasil dari studi literatur yang dilakukan menunjukan spesies *Cladophora glomerata* memiliki nilai perolehan selulosa tertinggi dengan kelompok alga hijau memiliki perolehan selulosa rata rata tertinggi. Variasi jenis asam yang digunakan pada proses hidrolisis dapat mempengaruhi terhadap sifat termal NCC. Kondisi hidrolisis seperti perbedaan konsentrasi asam dan waktu hidrolisis dapat mempengaruhi ukuran, sifat termal, dan kristalinitas NCC. Spesies alga yang digunakan dapat mempengaruhi pada ukuran NCC yang diperoleh. Secara perolehan selulosa, perolehan NCC, dan karakteristik NCC yang dihasilkannya, NCC biomassa alga dapat berpotensi untuk bersaing dengan NCC yang diperoleh dari biomassa kayu.

Kata kunci : Alga, Selulosa, Nanokristal selulosa, Pengaruh kondisi hidrolisis

ABSTRACT

The purpose of this study was to review articles related to the potential of algal biomass which includes the amount of cellulose yield and its characteristics as a source of cellulose and nanocellulose and to see the effect of hydrolysis conditions on the characteristics of NCC (cellulose nanocrystals). The method used in this study is based on a literature study with a systematic review model where the data used to be analyzed is secondary data sourced from various literature that is selected systematically according to related topics. The literature study stage begins by searching for articles through various online databases by entering keywords like Algae, Cellulose, Nanocellulose, and Nanocrystalcellulose, and then the articles are carried out in several stages of selection based on the type of literature (research articles), biomass source (algae), material produced (cellulose/ nanocellulose) and data match research with what will be discussed. The number of literature used as the main reference journal is 20 articles in the last 10 years covering 19 species of macroalgae. The results of the literature study conducted showed that the cladophora glomerata species had the highest cellulose yield value, while the green algae group had the highest average cellulose yield. The variation in the type of acid used in the hydrolysis process can affect the thermal properties of NCC. Hydrolysis conditions such as differences in acid concentration and hydrolysis time can affect the size, thermal properties, and crystallinity of the NCC. The algae species used can affect the size of the NCCs obtained. In terms of cellulose yield, NCC yield, and the resulting NCC characteristics, algal biomass NCC could potentially compete with NCC obtained from wood biomass.

Keywords : *Algae, Cellulose, Cellulose Nanocrystals, Effect of Hydrolysis Conditions*

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