

**SELULOSA BAKTERIAL DAN NANOKRISTALINNYA: PRODUKSI
DAN KARAKTERISTIK**

SKRIPSI

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



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NANOKRISTALINNYA: PRODUKSI DAN KARAKTERISTIK**

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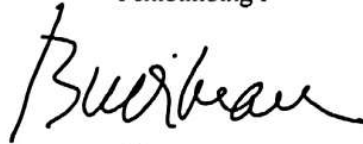
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PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul “**SELULOSA BAKTERIAL DAN NANOKRISTALINNYA: PRODUKSI DAN KARAKTERISTIK**” 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, Agustus 2020
Yang membuat pernyataan,

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ABSTRAK

Selulosa bakterial (BC) merupakan biopolimer yang secara luas digunakan dalam berbagai aplikasi. Penelitian ini bertujuan untuk mengkaji pengaruh medium dan kondisi kultur pada proses sintesis BC terhadap rendemen dan karakteristiknya dan mengkaji pengaruh kondisi hidrolisis pada proses isolasi selulosa bakterial nanokristal (BCNC) terhadap karakteristiknya dengan metode studi literatur bermodel *systematic review*. Studi literatur dilakukan dengan cara mengumpulkan data-data dari berbagai jurnal dalam rentang tahun 2009-2020, mengurutkan data sesuai topik dan menganalisis hasil data yang diperoleh untuk mencapai tujuan. BC dapat disintesis dengan bantuan bakteri dalam suatu medium kultur. Bakteri *Gluconacetobacter* dapat memproduksi selulosa dari berbagai sumber karbon. Perbedaan jenis sumber karbon, nutrisi dan waktu kultur berpengaruh pada rendemen BC namun tidak mempengaruhi morfologi dan struktur kristal selulosa yang dihasilkan. Limbah agrikultur mengandung berbagai jenis sumber karbon dan pemanfaatannya dapat dijadikan sebagai medium alternatif dalam memproduksi BC. Kondisi kultur (statis dan agitasi) berpengaruh pada kristalinitas BC yang dihasilkan. BC dari hasil sintesisnya memiliki morfologi serat jaring dan struktur kristalin selulosa tipe I. Isolasi BCNC dapat dilakukan dengan metode hidrolisis asam. Penghilangan bagian amorf serat menjadikan BC berukuran lebih kecil dan meningkatkan derajat kristalinitas. Perbedaan Waktu hidrolisis berpengaruh pada peningkatan kristalinitas dan nilai zeta potensial. Perbedaan perlakuan paska hidrolisis berpengaruh pada stabilitas termal BCNC.

Kata kunci: selulosa bakterial, selulosa bakterial nanokristal, karakteristik

ABSTRACT

Bacterial cellulose (BC) is biopolymer and widely used in various applications. This study aims to examine the effect of culture medium and conditions on the synthesis process of BC on yield and its characteristics and to examine the effect of hydrolysis conditions on the isolation process of bacterial cellulose nanocrystalline (BCNC) on its characteristics using a study literatur method with a systematic review type. The literature study was carried out by collecting data from various journals in the period 2009-2020, sorting the data according to the topic and analyzing the results of the data obtained to achieve the goal. BC can be synthesized by bacteria in culture medium. *Gluconacetobacter* bacteria can produce cellulose from various carbon sources. Different types of carbon sources, nutrients and culture time had an effect on the yield of BC but did not affect the morphology and crystalline structure of the resulting cellulose. Agricultural waste contains various types of carbon sources and can be used as an alternative medium in producing BC. Culture conditions (static and agitation) affected the crystallinity of BC. From the synthesized result, BC has morphology fiber and cellulose crystalline structure type I. Isolation of BCNC can be done by using acid hydrolysis method. Removing the amorphous region of the fiber makes BC smaller and increases the degree of crystallinity. The difference in hydrolysis time affects the increase in crystallinity and zeta potential value. The difference in post-hydrolysis treatment affected the thermal stability of BCNC.

Keywords: bacterial cellulose, bacterial cellulose nanocrystals, characteristics

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