

Micromechanics of bacterial cellulose composite gels = Micromechanics of bacterial cellulose composite gels

Kevin Setiadi, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20345427&lokasi=lokal>

Abstrak

Skripsi ini membahas mikromekanika gel komposit selulosa bakteri, terutama komposit pektin dan xyloglucan, dengan menggunakan rheometer pengontrol tekanan. Telah ditemukan bahwa pemampatan (compression) meningkatkan kekokohan dari jaringan selulosa dan meningkatkan perilaku strain softening. Pektin dan/atau xyloglucan memiliki efek yang berkebalikan dari pemampatan gel, karena mereka mengurangi kekokohan jaringan selulosa dan juga meningkatkan ekstensibilitas. Kemampuan selulosa bakteri untuk menyerap air setelah dimampatkan berkurang karena penggumpalan dari benang-benang selulosa. Waktu adsorpsi air optimum adalah sedikit di atas 60 menit.

.....The focus of this study is to investigate the micromechanics of bacterial cellulose composite gels, specifically pectin and xyloglucan composites, by using stress control rheometer. It was found that compression significantly increases rigidity of the cellulose network and promote reversible strain softening behaviour. Incorporation of xyloglucan and/or pectin was found to have an opposite effect from compression, as it decreases the rigidity of cellulose network and increases its extensibility. Ability of bacterial cellulose (only) to adsorb water after being compressed was decreased due to the agglomeration of cellulose fibres. The optimum water adsorption time was found to be slightly above 60 minutes.