

Comparative structural analysis of microbial cellulose and regenerated bacterial cellulose

Mazhar-ul-Islam, Waleed Ahmad Khattak,
Muhammad Wajid Ullah, 유보완, 조호정, 박중곤*
경북대학교
(parkjk@knu.ac.kr*)

Bacterial cellulose (BC) is receiving utmost familiarity owing to its copious applications in biomedical and related fields. Structural features of BC vary in a definite range and play a vital role in determining the suitability for specific applications. Regenerated BC (RBC) films are developed by initial dissolution of produced BC in some suitable solvents and later regeneration of BC films from dissolved solution. The structural features of RBC are expected to be somehow different from BC and thus might affect the physico-mechanical properties and applications of BC. A comparative structural analysis of BC and RBC films (produced by dissolving BC in N-methyl morpholine N-oxide) indicated several structural variations. FE-SEM analysis showed that the RBC fibers were much shorter with compact arrangement, comparing to BC. XRD analysis indicated two short peaks with lower intensity for RBC in comparison to two sharp and intense peaks for BC. Overall crystallinity of RBC was also lower from BC. These structural differences might lead to a different level of physical, mechanical and chemical properties of BC with consequent variation in applications.