

# **Cellulose**

## **Cellulose nanomaterials: New generation materials for solving global issues**

Mokhena, Teboho C  
Council for Scientific and Industrial Research  
Pretoria, 0001, South Africa  
Email: TMokhena@csir.co.za

### **Abstract**

This review describes the recent advances in the production and application of cellulose nanomaterials. Cellulose nanomaterials (CNMs), especially cellulose nanocrystals and cellulose nanofibers, can be produced using different preparation processes resulting in materials with unique structures and physicochemical properties that are exploited in different fields such as, biomedical, sensors, in wastewater treatment, paper and board/packaging industry. These materials possess attractive properties such as large surface area, high tensile strength and stiffness, surface tailor-ability via hydroxyl groups and are renewable. This has been a driving force to produce these materials in industrial scale with several companies producing CNMs at tons-per-day scale. The recent developments in their production rate and their applications in various fields such as medical sector, environmental protection, energy harvesting/storage are comprehensively discussed in this review. We emphasize on the current trends and future remarks based on the production and applications of cellulose nanomaterials.