Lignocellulosic nanomaterials for bonstruction and building applications

ABSTRACT

Lignocellulosic nanomaterials are nanoscale materials derived from lignocellulosic biomass and having the length ranges from 1 to 100 nm. Generally, lignocellulosic biomass consisting of three main cell wall components, namely, cellulose, hemicellulose, and lignin. Building material represents a variety of materials that are used for construction purpose including wood and timber, fired bricks and clay blocks, steel, concrete, cement composites, etc. Construction and building materials can be simply classified as structural and nonstructural materials. Concrete, wood, and steel are three of the main structural materials. Lignocellulosic nanomaterials are able to enhance the properties of construction and building materials by acting as a reinforcement to the concrete, coating for woods, and nanofiller for polymer composites. This chapter provides an overview on the available types of lignocellulosic nanomaterials and their application in the production of construction and building materials. Limitations and challenges dealing with the application of lignocellulosic nanomaterials were also discussed.

Keywords: Lignocellulosic nanomaterials; Nanocellulose; Nanolignin; Construction and building sector; Biological impact