

Development of biopolymer and conducting polymer-based optical sensors for heavy metal ion detection

ABSTRACT

Great efforts have been devoted to the invention of environmental sensors as the amount of water pollution has increased in recent decades. Chitosan, cellulose and nanocrystalline cellulose are examples of biopolymers that have been intensively studied due to their potential applications, particularly as sensors. Furthermore, the rapid use of conducting polymer materials as a sensing layer in environmental monitoring has also been developed. Thus, the incorporation of biopolymer and conducting polymer materials with various methods has shown promising potential with sensitively and selectively toward heavy metal ions. In this feature paper, selected recent and updated investigations are reviewed on biopolymer and conducting polymer-based materials in sensors aimed at the detection of heavy metal ions by optical methods. This review intends to provide sufficient evidence of the potential of polymer-based materials as sensing layers, and future outlooks are considered in developing surface plasmon resonance as an excellent and valid sensor for heavy metal ion detection.

Keyword: Biopolymer; Conducting polymer; Heavy metal ions; Optical sensors; Surface plasmon resonance