

Natural and engineered nanomaterials for the identification of heavy metal ions—a review

ABSTRACT

In recent years, there has been much interest in developing advanced and innovative approaches for sensing applications in various fields, including agriculture and environmental remediation. The development of novel sensors for detecting heavy metals using nanomaterials has emerged as a rapidly developing research area due to its high availability and sustainability. This review emphasized the naturally derived and engineered nanomaterials that have the potential to be applied as sensing reagents to interact with metal ions or as reducing and stabilizing agents to synthesize metallic nanoparticles for the detection of heavy metal ions. This review also focused on the recent advancement of nanotechnology-based detection methods using naturally derived and engineered materials, with a summary of their sensitivity and selectivity towards heavy metals. This review paper covers the pros and cons of sensing applications with recent research published from 2015 to 2022.