

A review of technologies used in handling the acid mine drainage challenge: Perspectives on using green liquor dregs as a sustainable option for treatment of acid mine drainage

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Abstract

Acid mine drainage (AMD) is one of the repercussions that result from earth-moving activities around the sulfide-bearing mineral hosts. The detrimental effects associated with this AMD are driven by its characteristics, which include low pH and high concentrations of sulfate and toxic dissolved metals. Traditionally, the prevention and treatment of AMD are achieved by using technologies that use, amongst other, naturally occurring soils and carbonates. However, the continual use of these materials may eventually lead to their depletion. On the other hand, industrial by-products have been proven to occupying land that could have otherwise been used for profitable businesses. Additionally, the handling and maintenance of landfills are costly. In this current trend of a circular economy that is driven by industrial symbiosis, scientists are concerned with valorizing industrial by-products. One such by-product is the green liquor dregs (GLD) from Kraft mills. The neutralizing and geotechnical properties of these wastes have prompted the research pioneers to seek their potential use in handling the challenges associated with AMD. In this review, the formation AMD, trends in technologies for treatment and prevention of AMD are critically analyzed. This includes the feasibility of using GLD as an alternative, promising sustainable material.