



Abstract

A Greek technological company has developed an innovative technology for the utilisation of fly ash shaped into pellets as a potential adsorbent for the removal of heavy metals from wastewater. It's an efficient and simple stabilisation process of the utilised adsorbents, guaranteeing their safe disposal in industrial landfills and eliminating the risk of polluting groundwater. The company now seeks partners for technical co-operation, license or those interested in purchasing the know-how.

Description

A Greek technological development company has developed an innovative technology for the utilisation of fly ash shaped into pellets as a potential adsorbent for the removal of heavy metals from wastewater.

Studies on the utilisation of low cost adsorbents for the removal of heavy metals from wastewater are winning attention. Fired coal fly ash, a solid by-product that is produced in power plants worldwide in millions of tonnes, has attracted the interest of researchers. With this technology fly ash is shaped into pellets that have a diameter in the range 3-8mm, high relative porosity, and very good mechanical strength.

The pellets were used in adsorption experiments for the removal of copper, lead, cadmium, zinc and chromium (III) ions from aqueous solutions. The experimental results for copper and cadmium adsorption fit well to a Langmuirian-type isotherm. Desorption experiments were performed in several extraction media. The results showed that all metals were desorbed substantially from pellets in acidic solutions. For this reason, metal-saturated pellets were encapsulated in concrete blocks synthesised from cement and raw pulverised fly ash in order to avoid metal desorption. The heavy metals immobilisation after encapsulation in concrete blocks was tested through leaching tests in several aqueous media.

Innovations and advantages of the offer

The technology proposed is an efficient and simple stabilisation process of the utilised adsorbents, thus guaranteeing their safe disposal in industrial landfills and eliminating the risk of polluting groundwater and other natural water receivers.

The proposed technology can be characterised as "green" and innovative for the following reasons:

- It exploits the hydraulic properties of an industrial solid by-product, the fly ash, which is produced in millions of tonnes worldwide, in order to develop porous and abrasion-resistant structures in the form of pellets. Moreover, it takes advantage of the adsorption properties of fly ash in order to utilise the resulting structures as an adsorption means for the efficient removal of heavy metals from industrial wastewater.
- It exploits the cementitious properties of fly ash in order to encapsulate the metal-saturated pellets into a concrete matrix, where a big amount of cement is replaced by fly ash. This way the excellent immobilisation of pollutants is achieved and the metal-loaded adsorbents can be safely disposed in industrial landfills.



INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT

Technology Offer

Utilisation of low-cost adsorbents for removal of heavy metals

(08 GR 49Q4 0IJQ)



For further information (including IPR status)

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