

Application of modified red mud in environmentally benign applications: A review paper

ABSTRACT

Red mud (RM) is a waste product that results from bauxite refining via the Bayer process. Its disposal remains an issue which raises significant environmental concerns, particularly if disposed on land or water bodies. Much research has been done on the use of red mud for environmentally-benign applications such as wastewater treatment, catalysis, the production of construction materials and glass ceramics, and for the recovery of metals. This paper reviews the current efforts made in the utilization of red mud as a valuable industrial by-product, which in turn should minimize its harmful impact on the environment. This detailed review compiles and highlights a variety of novel applications of modified red mud as a coagulant, an adsorbent for wastewater treatment, as well as, its use in catalytic processes and in building materials. The physico-chemical properties of red mud can be tuned by a range of treatment methods include acidification, neutralization and heat treatment. As revealed from the literature reviewed, modifications on red mud for the removal of various types of contaminants have shown promising results. However, further amendment and modifications on red mud are needed to utilize this industrial waste in many other industrial applications.