

Rare earth elements removal techniques from water/wastewater: a review

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ABSTRACT

The rare-earth elements (REEs) remain very important due to the growing increase in their demand and for their critical and indispensable use in many high-tech industries today. This growing demand for REEs has led to an increased environmental exposure and water pollution from numerous REEs commercial products and as a result, the recovery of REEs is a significant issue that requires appropriate consideration. There are diverse and various strategic techniques available to remove metal ions from aqueous solutions, but nanofiber adsorbent appears to be quite innovative due to their outstanding characteristics such as cost effectiveness, flexibility, high surface area, porosity, and the portable nature which makes them a better choice for potential adsorbent applications. This review presents a brief view on several typical removal techniques, new developments and applicable examples of the various technologies used for the removal of rare earth elements from water/wastewater solutions. The review highlights these developments with a particular focus on innovative physicochemical removal processes like adsorption as the process techniques most widely used.

Keywords: Rare-earth elements; Removal techniques; Adsorption; Ion exchange; Solvent extraction; Nanofibre

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