Adsorption Techniques for Heavy Metal Removal from Industrial Wastewater in Damonjodi, Odisha

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Abstract

The contamination of water resources by heavy metals, particularly in industrial zones, is a growing environmental concern. This research investigates the efficacy of adsorption techniques for the removal of heavy metals from industrial wastewater in Damonjodi, Odisha. As a region with considerable mining and industrial activities, Damonjodi's wastewater streams contain toxic metals such as lead (Pb), cadmium (Cd), and chromium (Cr), which pose significant risks to human health and the ecosystem. This study evaluates various adsorbents, including activated carbon, agricultural waste products, and synthetic adsorbents, assessing their performance in terms of removal efficiency, cost-effectiveness, and environmental sustainability. The findings provide insights into the practical applications of adsorption methods for treating industrial wastewater in the region, offering potential solutions for environmental remediation.

Keywords

Adsorption, Heavy Metals, Industrial Wastewater, Environmental Remediation, Activated Carbon, Agricultural Waste Products, Damonjodi, Odisha.