A REVIEW ON THE CADMIUM SULFIDE BASED PHOTOCATALYSTS AS AN EFFECTIVE REMOVAL OF THE HEXAVALENT CHROMIUM IN WASTEWATER

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ABSTRACT

A REVIEW ON THE CADMIUM SULFIDE BASED PHOTOCATALYSTS AS AN EFFECTIVE REMOVAL OF THE HEXAVALENT CHROMIUM IN WASTEWATER

Rapid urbanization and industrialization have led to increased water pollution caused by various chemical contaminants. Among these, one of the top ten issues affecting humanity in the twenty-first century is the pollution of water caused by different heavy metal ions. The heavy metal Cr(VI), hexavalent chromium, is one of the most dangerous of these pollutants. Hexavalent chromium Cr(VI) poses serious risks to ecological systems and human health because of its high solubility, acute toxicity, and potential for cancer. Therefore, throughout the past few decades, efficient methods such as ion exchange, membrane separation, chemical precipitation, and adsorption have been developed to remove or reduce environmental Cr(VI). However, there are many drawbacks to these conventional techniques, like high costs, limited efficiency, and energy consumption, which make them impractical. Photoreduction is well-known for its cost-effectiveness in waste degradation because it may be carried out at room temperature and requires no chemicals other than UV light. It also has a good reduction efficiency and results in a minimal number of cluster metal dopant particles. This research paper focuses on the usage of photoreduction process by using visible light driven cadmium sulfide based photocatalysts to resolve the issue. Several recent advancements have been studied regarding the photocatalytic performance of CdS-based photocatalysts in the removal of Cr(VI). Its performance on the photocatalysis of Cr (VI) varies depending on the materials incorporated, method of synthesis, pH, loading ratio, presence of sacrificial agents, and the morphology surface of the desired photocatalyst.

TABLE OF CONTENTS

LIST OF TABLES