

A Novel Composite Polymer for Chemical Oxygen Demand and Total Suspended Solids Removal

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Abstract

The removal of chemical oxygen demand (COD) and total suspended solids (TSS) had scrutinized using coagulating and flocculating process via new artificial compound formed from strontium chloride and polyacrylamide $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ -PAM. Which is a mixed of inorganic – organic hybrid polymer (HP). It is produced and arranged by reduction/oxidation reactions in which ammonium persulfate and sodium hydrogen sulfite were utilized to commence the polymer formation process with temperature of 50 °C in an aquatic medium. $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ -PAM (HP) was delineated and described using Fourier-transform infrared spectroscopy (FTIR) and transmission electron microscopy (TEM). The optimum amount of the new compound $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ -PAM (HP) was inspected, hence (COD) and total suspended solids elimination at varied precipitation time were measured. Outcomes revealed that 75% and 95% of (COD) and (TSS) respectively were dislodged through an optimum dose of 500 mg/L. $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ -PAM optimum dose is working efficiently at pH between 4.0 & 5.0. The new compound can work in one unit (Coagulation / Flocculation Unit) instead of two units (Coagulation and Flocculation Units) which leads to reduce the implementation and construction cost for wastewater treatment plants.