

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 SrCl₂.6(H₂O)-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. SrCl₂.6(H₂O)-PAM (HP) was delineated and described using Fourier-transform infrared spectroscopy (FTIR) and transmission electron microscopy (TEM). The optimum amount of the new compound SrCl₂.6(H₂O)-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. SrCl₂.6(H₂O)-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.