

Abstract

Coagulation and flocculation play a dominant role in many water and wastewater schemes. The success of treatment plant depends on the effectiveness of the coagulant and the clarifier. Clariflocculators have been used conventionally for the removal of suspended solids. These days, it is common to use a high rate modification of conventional systems like sludge blanket clarifiers. Superpulsator® manufactured and designed by Inflico Degremont, is one such proven clarification technology that results in a better effluent quality with minimal operating costs. However, this technology was yet to be examined for various applications like reducing the residual Aluminium levels. Therefore, a pilot plant based on Superpulsator® was designed and fabricated for a capacity of handling 8000 liters of water per day. For this, treatment plant of PHED at Surajpura was surveyed to understand the functioning of Superpulsator®. To analyse the performance of pulsator, a conventional clariflocculator model was also designed and fabricated.

Alum, the most widely used coagulant is well known for its poor performance in treating water with low turbidity and less alkalinity. PolyAluminium chloride, a relatively new polymeric Aluminium coagulant is increasingly being used in the treatment plants, is found to be more advantageous than alum. In this research, both the models were run at various turbidities in the range 2-30 NTU and their efficacy in reducing the residual Aluminium were compared.

The results of the research indicated that both the models yielded relatively lower residual aluminum levels. However, residual Aluminium in treated water by Pulsator was more close to the standard value of 0.030 mg/L as set by Indian regulations (IS 10500:2012).