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Optimization of Coagulation and Flocculation Process in Kandana Water Treatment Plant

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Coagulation and Flocculation process is used to remove colloidal particles and fine suspended materials from drinking water. Aluminium Sulphate /Alum is the most commonly used and widely available inorganic coagulants in the water treatment plants in Sri Lanka. But due to reduction of pH value, high sludge handling cost, presence of residual Aluminium and slow floc formation, alternative coagulants for the coagulation process become required. The efficiency of iron-based coagulants such as Ferric Chloride and Ferric Sulphate was compared to that of alum in this study. For this study, Kandana Water Treatment Plant was selected and raw water was taken from the Kalu Ganga. The quality of the treated water was analysed by conducting standard jar test and compared with alum. Raw and treated water samples were tested for turbidity, alkalinity, pH and colour. The main goal of this research was to use iron-based coagulants to improve the coagulation and flocculation process at Kandana Water Treatment Plant. According to the results obtained from the study, Ferric Chloride showed the highest turbidity reduction effectiveness. The combination of alum and ferric chloride (50 %+ 50 %) showed the best colour removal efficiency. The floc sizes generated with both Ferric Chloride and Ferric Sulphate, were greater than those with Alum.

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