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Effect of Thermal Energy on Inorganic Coagulation for the Treatment of Industrial Wastewater

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Abstract : Coagulation is considered to be one of the predominant water treatment processes which improve the cost effectiveness of wastewater. The sole purpose of this experiment on thermal coagulation is to increase the efficiency and the rate of reaction. The process uses renewable sources of energy which comprises of improved and minimized time method in order to eradicate the water scarcity of the regions which are on the brink of depletion. This paper includes the various effects of temperature on the standard coagulation treatment of wastewater and their effect on water quality. In addition, the coagulation is done with the mix of bottom/fly-ash that will act as an adsorbent and removes most of the minor and macro particles by means of adsorption which not only helps to reduce the environmental burden of fly ash but also enhance economic benefit. Also, the method of sand filtration is amalgamated in the process. The sand filter is an environmentally-friendly wastewater treatment method, which is relatively simple and inexpensive. The existing parameters were satisfied with the experimental results obtained in this study and were found satisfactory. The initial turbidity of the wastewater is 162 NTU. The initial temperature of the wastewater is 27 C. The temperature variation of the entire process is 50 C-80 C. The concentration of alum in wastewater is 60mg/L-320mg/L. The turbidity range is 8.31-28.1 NTU after treatment. pH variation is 7.73-8.29. The effective time taken is 10 minutes for thermal mixing and sedimentation. The results indicate that the presence of thermal energy affects the coagulation treatment process. The influence of thermal energy on turbidity is assessed along with renewable energy sources and increase of the rate of reaction of the treatment process.

Keywords : adsorbent, sand filter, temperature, thermal coagulation
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