

A STUDY ON TREATMENT OF GREY WATER USING CEMENT KILN DUST AND CHEMICAL COAGULANTS

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Introduction:

The greywater treatment will play an important role in the management of water resources and reduce the stress on fresh water. The treated greywater can be an alternative source of water for agriculture and horticulture. The treated greywater can be used for non-portable domestic purposes like cleaning, washing, gardening, etc. In this part of the country the scope of the grey water is very much high due to scarcity of fresh water sources. We are in the centre of the city where there are no perennial rivers flowing through. So, it is essential to treat greywater.

Objectives:

1. To study the greywater qualities before and after the application of coagulants.
2. To investigate the efficiency of cement kiln dust and chemical coagulant (Alum) in the treatment of greywater.
3. To compare the coagulants in-terms of cost.
4. Recycle and reuse of wastewater for non-portable purposes.

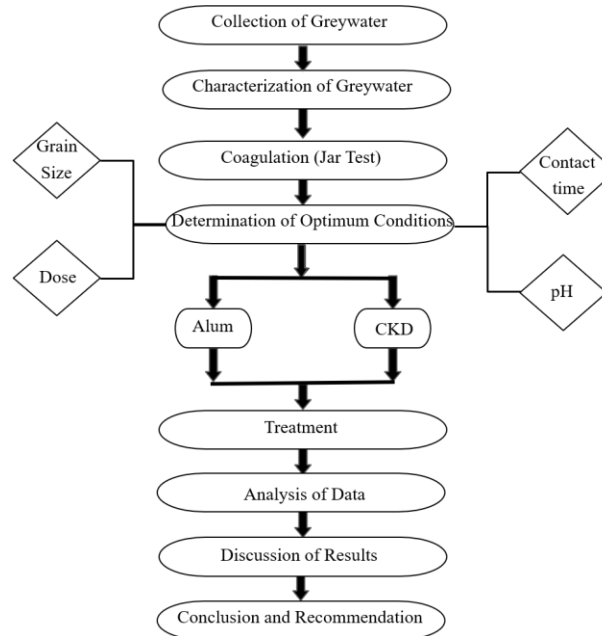
Methodology:

• **Collection of grey water**

The actual grey water is collected from college boys hostel (SIR MVIT). The greywater is collected by grab sampling method.

• **Analysis of grey water**

The Turbidity, pH, conductivity, DO & BOD is determined before and after the experimentation. The turbidity is determined using Nephlo Turbidity Meter. The pH was determined using a digital pH meter. The conductivity is determined by Electrical Conductivity meter. The DO & BOD is determined by Winkler Idometric method.



- **Selection of coagulants**

After studying research papers it is decided to select alum as chemical coagulant and cement kiln dust as the second coagulant since not much research has been carried out on these components.

- **Experimentation by using coagulants**

Experiment is done in a jar test apparatus, where cement kiln dust and alum is added to coagulate sample of greywater. Experiment is carried out as batch consisting of a series of 6 beakers together with 6 spindle steel paddles digitally controlled mixing speed. The effects of coagulant grain size, dosage, pH, contact time of turbidity removal, DO & BOD were examined.

Results and discussion:

Experiments are carried out in a jar test apparatus to find the effect of coagulant grain size, dosage, pH & contact time on greywater treatment by adding alum and cement kiln dust. The physiochemical characteristics of greywater such as turbidity, pH, conductivity, DO, BOD are measured with respect to coagulant grain size, dosage, pH, contact time.

Conclusions:

1. The removal efficiency of the greywater by CKD is nearly equal to that of alum.
2. For the treatment of 10lakh liters of greywater the cost of alum requires Rs.36,000/-. Since some quantity of CKD is not reused and is disposed as waste (Around 30%). So, it can be used as a cost effective coagulant for the treatment of greywater.

3. The treated water can be used for non-portable purpose as the treated water quality is improved using these coagulants.

Scope of future work:

1. A study can be carried out using same methodology in the treatment of industrial wastewater (heavy metals).
2. A study can be carried out using same methodology in the treatment of municipal waste water.