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Influence of Natural Coagulants in Turbid Water Treatment

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Abstract - *Plants based-coagulants are naturally occurred that can be used in the coagulation-flocculation process of waste water treatment for reducing turbidity. Natural coagulants are safe and eco-friendly. It can be extracted from plant, microorganisms and animals. Some of the plants are able to be a coagulant because they are able to conduct some of the coagulation mechanisms which are neutralizing the charge in colloidal particles and perform polymer bridging. The objectives of this project to assess the possibility of using natural coagulants as an alternative to the current commercial synthetic coagulant such as aluminium sulphate and to optimize the coagulation process. Natural coagulants used for our study are Dolichos lablab, okra seeds, Moringa Oleifera, Tulsi, Neem, which are locally available from flora.*

Key Words: Natural coagulant, polymer bridging, turbidity, chemical coagulant.

1. INTRODUCTION

Nowadays, the use of chemical coagulants became more. To purify waste water, we are using aluminum sulphate and other kinds of chemical coagulants. The continuous use of these coagulants can harm our body. For preventing this, we should substitute it with harmless coagulants such as natural coagulants.

2. OBJECTIVE

To screen different plant seeds to find a primary natural coagulant able to reduce the turbidity of water.

The protein from 7 different seeds is extracted with water and coagulation properties in synthetic solution are studied. To make the water treatment process easier and eco-friendly for household application

3. MATERIALS & METHODS

3.1. Preparation of coagulants.

The coagulants used here are Okra seeds, Dolichos lablab, Moringa Oelifera, Neem leaves and Tulsi leaves. These items were washed and dried under sunlight for 4 to 5 days. After grinding them into fine powder they were stored in an airtight container to prevent the entry of moisture into it.

3.2. Preparation of Turbid water.

Turbid water was prepared by adding sufficient clay and water in order to achieve 20 NTU which is a constant value.

3.3. Methodology

Turbidity, pH, Alkalinity, Hardness of each coagulants at different dosages are found out using various experiments. After preparing turbid water, the samples were taken in 3 jars. After that coagulants are added at various dosages such as 50mg/l, 60mg/l, 70mg/l. Then jar test is conducted. After settling, the tests were conducted.

Table -1: Characteristics of Turbid water

Parameters	Values
Turbidity (NTU)	20
pH	5.82
Hardness	200
Alkalinity	192

4. RESULTS AND DISCUSSIONS

After conducting jar tests, values for Alkalinity, pH, Hardness, Turbidity were found out. The turbidity of each samples was measured by using Nephelometer Turbidity meter and pH using pH device.

Table-2: Characteristics after treating with Okra seeds

Parameters	50mg/l	60mg/l	70mg/l
Turbidity	15.61	14.52	14.67
pH	6	7.43	7.82
Alkalinity	154	152	156
Hardness	174.5	178	173

Table-3 : Characteristics after treating with Dolichos Lablab

Parameter	50mg/l	60mg/l	70mg/l
Turbidity(NTU)	15.8	14.3	13.7
pH	6.4	6.2	6.6
Alkalinity	176	170	173
Hardness	183	156	105

Table-4: Characteristics after treating with Tulsi leaves.

Parameters	50mg/l	60mg/l	70mg/l
Turbidity	12	9	3
pH	7.8	7.15	6.3
Alkalinity	160	142	140
Hardness	189	167	142

Fig -1: Okra seeds

Fig – 2: Dolichos lablab

Fig– 3 : Dolichos lablab

Fig-4: Tulsi leaves powder

4. CONCLUSION

In this study we mainly analyzed the turbidity removal efficiency of various coagulants such as okra seeds, dolichos lablab, tulsi leaves. Here tulsi leaves at the dosage of 70mg/l gives the value which is smaller in turbidity as compared to the other.

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