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EXPERIMENTAL STUDY OF WATER QUALITY USING VARIOUS NATURAL BIO- ABSORB

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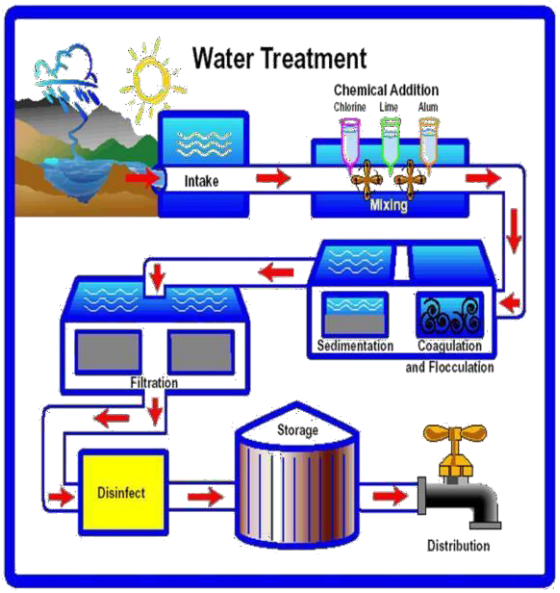
ABSTRACT: Good water quality is essential for drinking, environmental protection and also for other domestic purposes. In now a days, an increasing demand of water quality due to human activities has become a great importance. This study aims to investigate and analyze the water quality using various bio- absorbents. The water samples were analyzed for drinking water parameters. Jar test experiments were carried out for the levels of turbidity with the coagulants. This study is used to refine the water and to change it into the portable water. In this study, natural coagulants are used behalf of the chemicals which is used regularly. This study shows the combination of bio-absorbents for the treatment. The result of this study shows that similar to the drinking quality of the water.

INTRODUCTION: In this study, natural coagulants are used behalf of the chemicals which is used regularly. This study shows the combination of bio-absorbents for the treatment. The result of this study shows that similar to the drinking quality of the water.

SCOPE:

- This study focuses on purification of water using natural bio-absorbents.
- Reduced expenditure on processing of costly chemicals.
- Development of new industry of bio- coagulant industry.
- Reduced dependency on chemicalcoagulants.
- Process is very economical for developingcountries.
- The bio-coagulants are eco-friendly.
- This project seeks to check the standard parameters of the water.

METHODOLOGY:



EXPERIMENTAL PROCEDURE: TURBIDITY:

One of the other reasons are contamination which causes ill-effects. If a large amount of suspended matter such as clay, silt or some other finely divided organic materials are presentin water, it will appear to be muddy orcloudy or turbid in appearance.

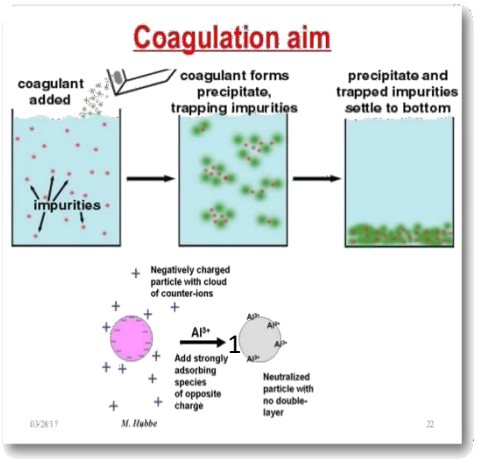
ABSORPTION:

Absorption is a mass transfer process which involves the accumulation which involves theaccumulation of substances at the interface of two phases such as liquid – liquid, gas – liquid, gas – solid or liquid – solid interface.

The substance being absorbed in the absorbate and the absorbing materials is termed as absorbent.

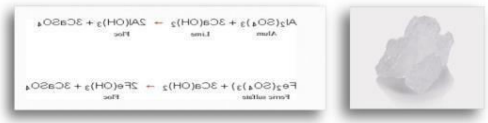
SEDIMENTATION AIDED WITH COAGULATION:

Coagulation is the method of purification of water where very **fine particles, colloidal particles, mud, floating particles (suspension)** are removed of in short duration. Colloidal particles are **negatively charge** which makes a rigid bond surrounding water forming a layer called **Stern layer**, due to which colloidal particles do not settle down in plain sedimentation tank.



PURPOSE OF COAGULATION:

The purpose of coagulation is to destabilise the bond between colloidal particles and water. The chemicals added to the water is known as **Coagulant.** Generally, there are four types of coagulant. They are;



- Alum (Aluminium sulphate)
- Copperas (Ferrous Sulphate)
- Chlorinated Copperas(Chlorine+Copperas)
- Sodium Aluminate
- Alum is widely used as a coagulant. However, there is concern about its associated risk of Alzheimer disease. Thus, the natural bio-absorbents are widely produced.
- Tests will be carried out to evaluate the optimal dosages and conditions required to achieve optimum removal of both turbidity and humic acid. Based on the results of jar test, the process will be done.

DRINKING WATER PARAMETERS:

S.No	Parameters	Desirable Limits	Permissible Limits	Units
1.	Odour	Agreeable	Agreeable	-
2.	Taste	Agreeable	Agreeable	-
3.	Turbidity	1	5	NTU
4.	pH	6.5	8.5	Number
5.	Total Hardness (as Calcium Carbonate)	200	600	mg/l
6.	Total Iron (as Fe)	0.3	0.3	mg/l
7.	Chloride (as Cl)	250	1000	mg/l
8.	Residual Free Chlorine	0.2	1	mg/l
9.	Total Dissolved Solids (TDS)	500	2000	mg/l
10.	Calcium (Ca)	75	200	mg/l
11.	Magnesium (Mg)	30	100	mg/l
12.	Manganese (Mn)	0.1	0.3	mg/l
13.	Sulphate	200	400	mg/l
14.	Nitrate	45	45	mg/l
15.	Fluoride	1.0	1.5	mg/l
16.	Total Alkalinity	200	600	mg/l
17.	Boron	0.5	1	mg/l
18.	B.O.D (5 days @ 27°c)	<5	<5	mg/l

SAMPLE TAKEN:

PAPAYA SEED DRIED:

CITRUS PEELS IN OVEN:

POWERED FORM:

MORINGA OLEIFERA SEEDS:

CITRUS PEEL:

POWERED FORM:

MORINGA SEEDS AND PAPAYA SEEDS:

NATURAL LAKE SAMPLE;

S.No	Parameters	Results	Units
1.	Odour	Agreeable	-
2.	Taste	Agreeable	-
3.	Turbidity	5	NTU
4.	pH	7.19	Number
5.	Total Hardness (as Calcium Carbonate)	721	mg/l
6.	Total Iron (as Fe)	0.2	mg/l
7.	Chloride (as Cl)	608	mg/l
8.	Residual Free Chlorine	0.8	mg/l
9.	Total Dissolved Solids (TDS)	38	mg/l
10.	Calcium (Ca)	341	mg/l
11.	Magnesium (Mg)	90.8	mg/l
12.	Manganese (Mn)	0.45	mg/l
13.	Sulphate	527.2	mg/l
14.	Nitrate	0.09	mg/l
15.	Fluoride	1.6	mg/l
16.	Total Alkalinity	58.9	mg/l
17.	Boron	1.59	mg/l
18.	B.O.D (3 days @ 27 'c)	<5	mg/l

MIXING OF MORNIG OLEIFERA SEED POWDER AND PAPAYA SEED POWDER:

S.No	Parameters	Results	Units
1.	Odour	Agreeable	-
2.	Taste	Agreeable	-
3.	Turbidity	1.6	NTU
4.	pH	6.87	Number
5.	Total Hardness (as Calcium Carbonate)	295	mg/l
6.	Total Iron (as Fe)	<0.01	mg/l
7.	Chloride (as Cl)	372	mg/l
8.	Residual Free Chlorine	Nil	mg/l
9.	Total Dissolved Solids (TDS)	21	mg/l
10.	Calcium (Ca)	163	mg/l
11.	Magnesium (Mg)	85	mg/l
12.	Manganese (Mn)	<0.01	mg/l
13.	Sulphate	119.4	mg/l
14.	Nitrate	0.02	mg/l
15.	Fluoride	1.3	mg/l
16.	Total Alkalinity	40.3	mg/l
17.	Boron	0.88	mg/l
18.	B.O.D (3 days @ 27 'c)	<3	mg/l

MIXING OF ORANGE AND SWEET LIME PEEL POWDER:

S.No	Parameters	Results	Units
1.	Odour	Agreeable	-
2.	Taste	Agreeable	-
3.	Turbidity	2.9	NTU
4.	pH	7.08	Number
5.	Total Hardness (as Calcium Carbonate)	487	mg/l
6.	Total Iron (as Fe)	<0.01	mg/l
7.	Chloride (as Cl)	413	mg/l
8.	Residual Free Chlorine	Nil	mg/l
9.	Total Dissolved Solids (TDS)	32	mg/l
10.	Calcium (Ca)	192	mg/l
11.	Magnesium (Mg)	41	mg/l
12.	Manganese (Mn)	<0.01	mg/l
13.	Sulphate	269.6	mg/l
14.	Nitrate	0.01	mg/l
15.	Fluoride	0.9	mg/l
16.	Total Alkalinity	47.5	mg/l
17.	Boron	0.93	mg/l
18.	B.O.D (3 days @ 27 'c)	<4	mg/l

CONCLUSION:

The present study has been undertaken to analyze the water quality by using natural bio-absorbents without using chemicals as coagulants. This study alsohelps to understand the drinking parameters and quality of the water.

From this experimental study, the water taken from the stream is checked and analysed where the drinking water parameters are within the limits.

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