

Study and Analysis of PAC And Aloe vera as A Coagulant for Wastewater Treatment

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ABSTRACT

This study focused on various treatment to treat the water efficiency. Among these process coagulation is the best process to remove the colloidal particles from the water. The raw water sample collected from sewage treatment plant (STP) situated in Daund area. The optimum does which is used for the treatment is obtained by the jar test, and applied the dosage of PAC of 35 mg/l , 55mg/l and 45mg/l respectively and dosages are 1ml/l , 2ml/l and 3ml/l respectively. We have determine the physical and chemical properties. PH , BOD , COD , TDS , TSS of the wastewater before and after applied the STP .

I. INTRODUCTION

Safe drinking water is one of the biggest problems in front of all over the country. Rural area highly treated drinking water can't be reach. Coagulant are two types inorganic and organic. Organic coagulant includes polyaluminium chorides polydiallyl ammonium choride. The growing environmental pollution needs for decontaminating wastewater result in the study of characterization of wastewater, especially domestic sewage. In the past, domestic wastewater treatment was mainly confined to organic carbon removal. Recently, Increasing pollution in the wastewater leads to developing and implementing new treatment techniques to control nitrogen and other priority pollutants now a days on small scale (i.e housing society, Hotels , Commercial buildings, etc) Packaged sewage treatment plants are used to treat the sewage generator. The conventional sewage treatment plants requires more space for installation and it consists of number of treatment units and hence energy and maintenance cost is more therefore we are carrying out this project to provide a proper solution for conventional wastewater treatment plant.

II. PAC AND ALOEVERA MATERIAL

Wastewater, Coagulants like Aluminium Sulfate (Alum), and Poly aluminium chloride (PAC), Aloe vera.



III. Objectives

- 1.To find out the proper solution for conventional wastewater treatment plant.
- 2.Reduction in wastewater treatment units.
- 3.To reduce the installation area.

- 4.To achieve Economy.
- 5.To find its efficiency

IV. Scope of project work

Following are the scope of present investigation

- 1. Preliminary investigation on turbidity removal by alum and PAC.
- 2. Laboratory experimentation pertaining to the assessment of PAC over Alum as an effective coagulant .
- 3. Studies and comparison on the effect of turbidities, pH and the effect of dosages (concentration) for alum and PAC on raw water sample.
- 4. Analysis of the physicochemical parameters of the treated water and the volume of sludge generates with respect to both the coagulants .
- 5. Characterization of the treatment plant sludge (alum and PAC) and suggests its suitability of futuristic application .

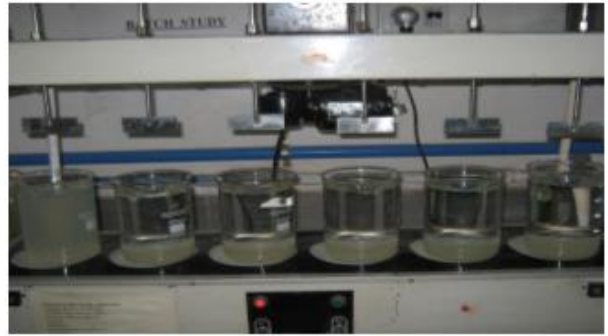
V. METHODOLOGY

The growing environmental pollution needs for decontaminating wastewater result in the study of characterization of wastewater, especially domestic sewage. In the past, domestic wastewater treatment was mainly confined to organic carbon removal. Recently, Increasing pollution in the wastewater leads to developing and implementing new treatment techniques to control nitrogen and other priority pollutants now a days

ANALYSIS OF WASTEWATER

- 1. The waste water contain varirty of contaminants which affect the quality of water makes unusable, hence the analysis the water.
- 2. The waste water which is analysed, is collected from different place.

- 3. different type of physical and chemical parameters like, PH ,BOD,COD,TDS,TSS of waste water were analysed.
- 4. Use parameters efficiency is more .



JAR TEST

VI. RESULT

1.Raw sample

Parameters	Raw sample
PH	7.60
BOD(Mg/l)	135
COD(Mg/L)	495
TDS(Mg/L)	340
TSS(Mg/L)	170
TURBIDITY(NTU)	43.6

Table no-1

2.PAC as a coagulant

The analysis of the wastewater with PAC as coagulant with dosages of 35 mg/L, 55mg/ L & 85 mg/L was done. From the Table.2 the results shows that for the different PAC dosing the BOD & COD removal efficiency was found to be around 85% for 55mg/L dosage. The Turbidity was found to be 95% efficient for 55mg/L dosage as compared to other two dosages. Observation, Thus the optimum dosage was 55mg/l of PAC.

Parameters	Dosage(PAC)				
	Raw Sam ple	0.035	0.045	0.055	0.065

PH	7.6	7.20	7.10	6.99	6.27
BOD(mg/L)	135	16	15.7	14.7	18.2
COD(mg/L)	495	190	81	85	89
TDS(mg/L)	340	335	325	310	393
TSS(mg/L)	170	110	62	60	72
Turbidity	43.6	15.4	10.5	8.32	14.5

Table no-2

3.ALOEVERA as a coagulant

The analysis of the wastewater with ALOEVERA as coagulant with dosages of 10 mg/L, 20 mg/ L & 60 mg/L was done. From the Table.2 the results shows that for the differen ALOEVERA dosing the BOD & COD removal efficiency was found to be around 70% for 60mg/L dosage. The Turbidity was found to be 78% efficient for 30mg/L dosage as compared to other two dosages. Observations,Thus the optimum dosage was 30mg/l of PAC.

Parameters	Dosage(Alovera)				
	Raw Sample	0.010	0.020	0.030	0.040
PH	7.6	5.4	5.9	7.4	8.2
BOD(mg/L)	135	15.3	14.9	14.7	17.5
COD(mg/L)	495	128	110	85	95
TDS(mg/L)	340	290	260	245	265
TSS(mg/L)	170	145	110	115	130.2
Turbidity	43.6	15.5	13.2	6.62	6.76

Table no-3

4.PAC+ALOEVERA

The analysis of the wastewater with combination of (PAC+Aloevera) as coagulant with dosages as PAC – 35mg/L,55mg/L & 85mg/L and Aloevera 1mg/L, 2mg/L & 3mg/L was done. it is observed that for the different (PAC+Aloevera) combination dosing the BOD & COD removal efficiency was found to be around 85%for0.30mg/(PAC)+2mlgL(Aloe Vera) dosage . The Turbidity was found to be 84% efficient for the same dosage as compared to other dosages.

observations shows that (Table no.3),Thus the optimum dosage was 0.45mg/L of (PAC)+ 2mg/L.

Parameters	Dosege((pac+Aloevera mg/l))						
	Raw Sample	0.03	0.04	0.05	0.06	0.07	0.08
PH	7.6	7.3	7.2	7.5	7.1	7.4	7.2
BOD	135	15.3	13.4	12.6	10.8	14.7	15.2
COD	495	130	110	112	136	116	108
TDS	340	320	300	300	300	330	300
TSS	170	112	46	64	24	28	16
Turbidity	43.6	7.3	8.0	8.1	3.2	4.1	4.9

Table no-4

5.Comparison between PAC and PAC+ALOEVERA as a coagulant

According to CPCB norms permissible limits fixed for inland surface water remains within the permissible limits for considered parameters. Out of all considered parameters it's observed that turbidity is increased by 58.26%. Drawn cost estimation laid down after study shows that PAC without Aloevera is cheaper than PAC+ Aloevera by 45% for a capacity of 10 kld of waste water

Parameters	Dosage		
	Raw sample	0.055	0.045+2
PH	7.6	6.99	7.2
BOD	135	14.7	13.4
COD	495	85	110
TDS	340	310	300
TSS	170	60	46
Turbidity	43.6	8.32	8.0

Table no-5

Result Analysis

CHART 1 : PAC as a coagulant

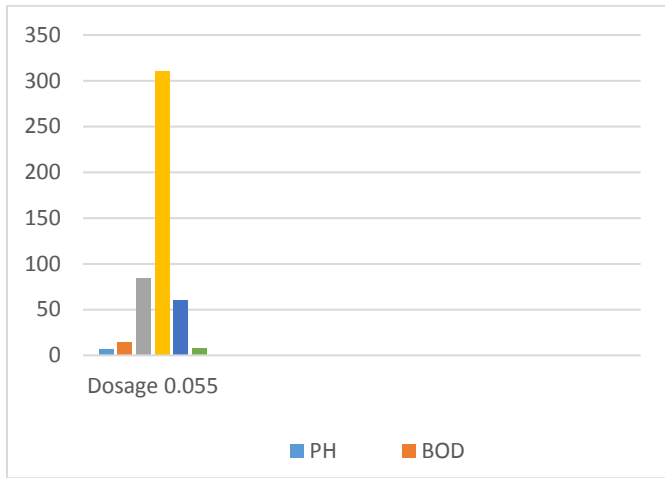


Chart no-1

CHART NO-2 ALOEVERA Coagulant

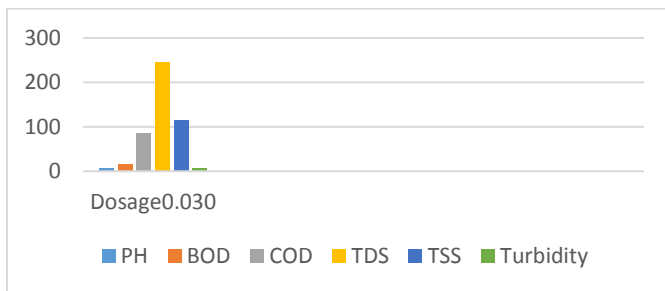


Chart no-2

CHART NO-3 PAC + ALOEVRA

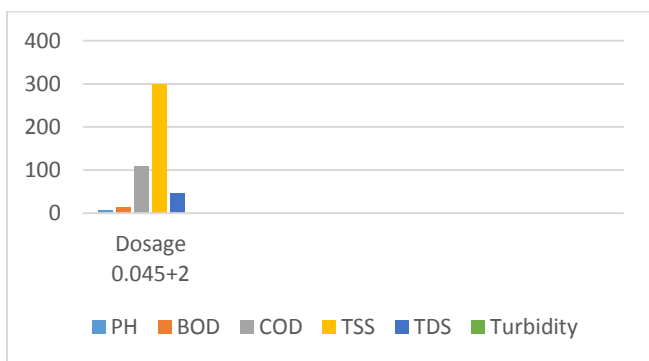


Chart no -3

CHART NO-4 Comparison between optimum Dosages PAC ,PAC+ALOEVERA ,ALOVERA

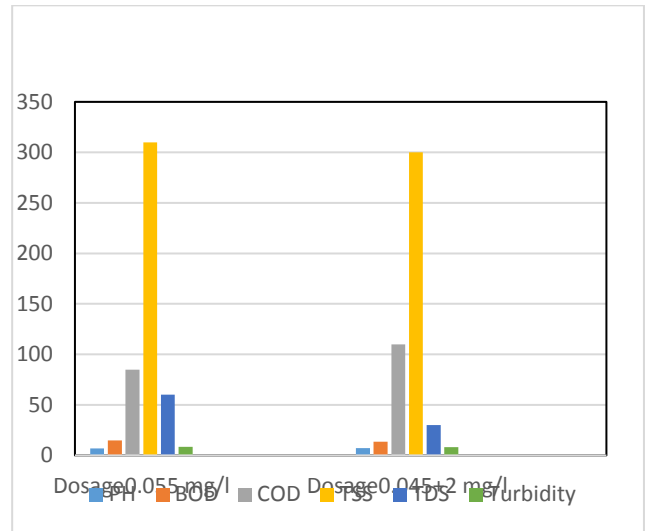


Chart no-4

VII. CONCLUSION:

In general the optimum dosage of coagulant of PAC was 55mg/.In general the o Effect of pH, temperature can also be experimentally found out with the extension of current study, which may further improve the turbidity removal efficiency of the natural coagulant.optimum dosage of coagulant of aloe vera was 3%.The BOD and COD removal efficiency was found to be around 85 %.

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