PAPER NAME

Cod research paper final ab (1) sp.docx

WORD COUNT	CHARACTER COUNT
1640 Words	**8595 Characters**
PAGE COUNT	FILE SIZE
6 Pages	**154.8KB**
SUBMISSION DATE	REPORT DATE
Feb 29, 2024 11:39 AM GMT+5:30	**Feb 29, 2024 11:39 AM GMT+5:30**

11% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 4% Internet database
- 9% Publications database
- Crossref database
- Crossref Posted Content database
- 8% Submitted Works database

Excluded from Similarity Report

- Bibliographic material

Innovative and Sustainable Techniques of COD Removal.

[1] Pro. Dr. Farooq Chavan
Assitant Professor Of Civil department, Shrama Sadhna Bombay Trust's College of Engineering, Bambhori , Jalgaon [MS] India
Email :- farooqamaravati@gmail.com.

[2] Varad Vpute ,
Final Year Civil Engineering Student , Shrama Sadhna Bombay Trust's College of Engineering, Bambhori Jalgaon [MS] India
Email: varad20pute2002@gmail.com.

[3] Pro. Dr. Sonali P. Patil
Assitant Professor Of Civil department, Shrama Sadhna Bombay Trust's College of Engineering, Bambhori , Jalgaon [MS] India
Email :- patil.sonali@SSCOETJalgaon.ac.in.

[4] Prof. Wagh Hemant Dagadu
Assistant Professor
H.O.D. CIVIL ENGINEERING DEPARTMENT
SHRI JAYKUMAR RAWAL INSTITUTE OF TECHNOLOGY, DONDAICHA
E-MAIL : waghhd18@gmail.com.

Abstract :-

Today's world faces the problem of water scarcity and various solutions have been developed to solve this problem. The best way to solve this problem is to create an economical and cheaper way to provide publicly available and sustainable water. Water, one of the most important and valuable things in the world, is a source of great concern because changes in its content can endanger society and health. However, in today's ever-changing world, this ideal has changed surprisingly. Increasing world population, urbanization, industrialization and unbalanced human consumption are important priorities that will have an impact on the world's freshwater resources. Limited water resources have claimed millions of lives, especially children who need water to maintain their metabolism.

The quality of life is directly related to and quality of water that consumed. In the market various method is available to remove COD but chemicals used in this method is harmful and expensive. The aim of the our research is to remove COD without using harmful chemical and economically. In this research study the material are ubiquitously available in the nature. Currently, water scarcity affects 40% of the world's population, and this number is expected to increase in the future.

Keywords :-, Adsorbents, Adsorbate, Wastewater, Pollution, Water, Neem Leaves, Coconut Husk, JamunLeaves, Maize, Contaminants, COD.

Introduction

The aim of the our research is to remove COD without using harmful chemical and economically, in this research we use the binds of sorbents which are easily available Now that more than a year has passed and the world is dealing with the ongoing wave of the coronavirus pandemic, there is an urgent need for optimal purification of all types of wastewater and water because connection between wastewater and water, two of which are ubiquitous in our home society. Wastewater treatment incurs marginal cost to taxpayers; this pays monetary tax and franchise tax if publicly managed and costs are incurred if privately manage

Objectives of the research

1. Remove COD economically and sustainable
2. Prepare various blends of sorbents and repeat the studies.
3. IT study the kinetics of removal of contaminates using the selected sorbents .
4. Prepare blends of sorbents under the varying ratiosstudy the COD removal rate
5. Prepare the sorbents from coconuts, neem, rice husk

Figure 1 : Neem Power

This research over here was trial and error method as various blend ratio of mixes would have been tried but here only blend ratio were used of 4 sorbent (Neem Leaves, coconut husk, jamun leaves and maize) viz. 1:1:1:1, 2:3:4:5, 1.8:2.5:3.5:4.5

Sr. No.	Initial Concentration	Equilibrium percentage removal of COD at various concentration		
		Neem Leaves	Jamun Leaves	Maize
1.	300mg/l	87	86	95
2.	500mg/l	83	82	90
3.	700mg/l	60	79	86

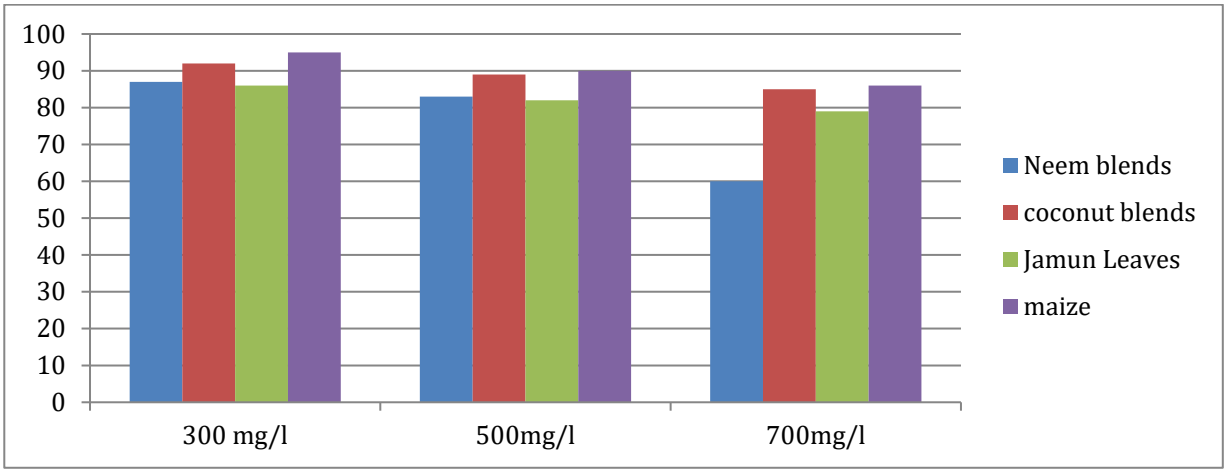

Figure 2 :- Comparision Of Percentage COD Removal

CHARACTERIZATION OF ADSORBATES :-

Parameters	Characteristics of Raw Wastewater at sampling Site
pH	7.4
Total Solids	1200 mg/l
Total Dissolved Solids	1102 mg/l
Total Suspended Solids	80 mg/l
Alkalinity	335 mg/l
BOD	457 mg/l
COD	855 mg/l
Total Nitrogen	5.8 mg/l
Sulfate	118 mg/l
Nitrate	1 mg/l

Figure 3 : charactertics of absorbates

This above table shows the characteristics of adsorbent near lendi nala, pimprala, whose location is shown on google earth in the preceding chapters. The COD and TDS are highest in this wastewater, but due to time constraints only COD was taken as parameter of study to treat the wastewater by adsorption

Alteration of Initial Concentration and contact time on percentage

The batch adsorption experiments were conducted by altering the initial concentration of the adsorbents viz. Neem Leaves, Coconut Husk, Jamun Leaves and maize to study the rate of percentage removal of COD. The experiments were conducted at constant adsorbent dose 3 g/l, constant agitation speed of 150rpm, constant temperature 20°C, at constant and optimum pH of 7.2, but at Different initial concentrations viz. 300 mg/1, 500 mg/l and 700 mg/l.

removal of COD by Neem leaves,Coconut husk, Jamun Leaves and Maize

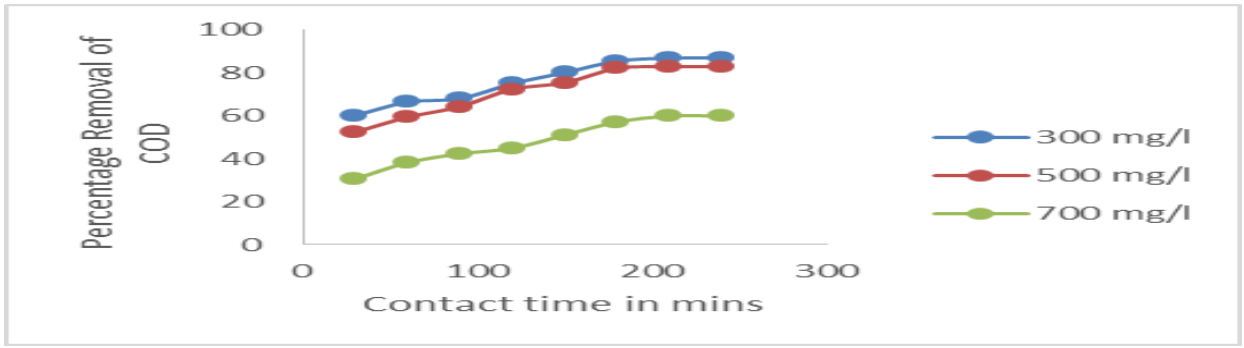

Figure 4 Neem leaves

The neem blend of neem made at different concentration and at the different cotact time , time time to attain was 210 mins. S the initial concentration of adsorbate is increased from 300 to 500 mg/l the percentage removal of COD decreases, as the less surface sites are available for the adsorption due to repulsion between adsorbant and adsorbate.
The bends are made from the neem leaves decreases COD from 86 % to 60%.

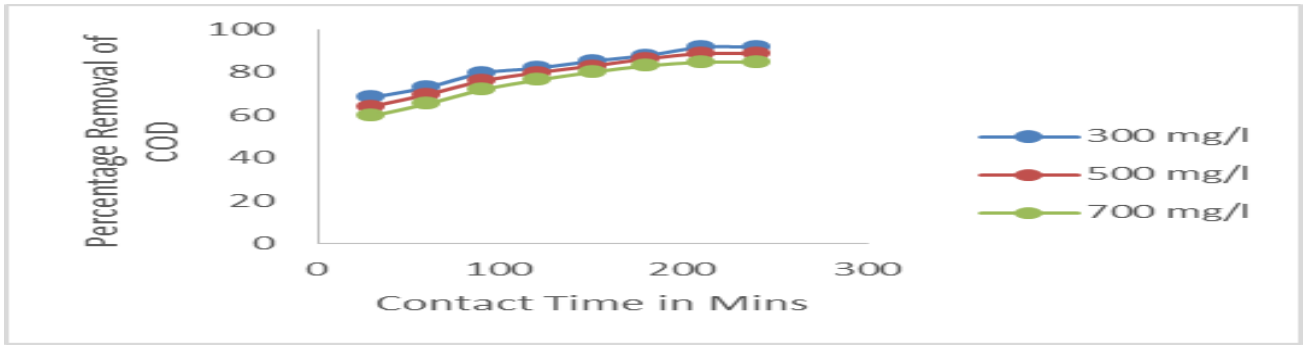

Figure 5 : coconut husk

Effect of Initial Concentration and contact time on percentage removal of COD by Coconut Husk the concentration of the COD due to the coconut husk blends is 92 % to 85%.

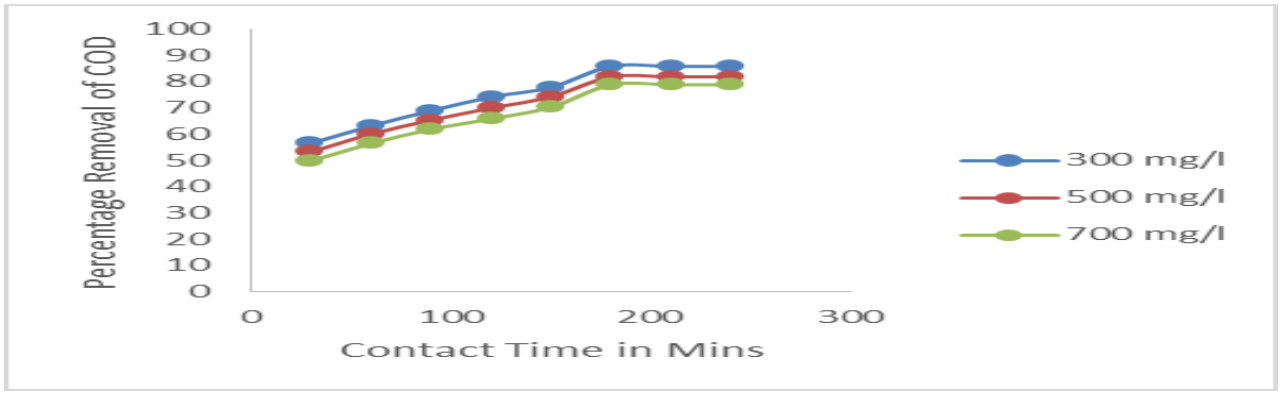

Figure 6 : Jammun Leaves

Effect of Initial Concentration and contact time on percentage removal of COD by Jamun Leaves is 86% to 79 % .

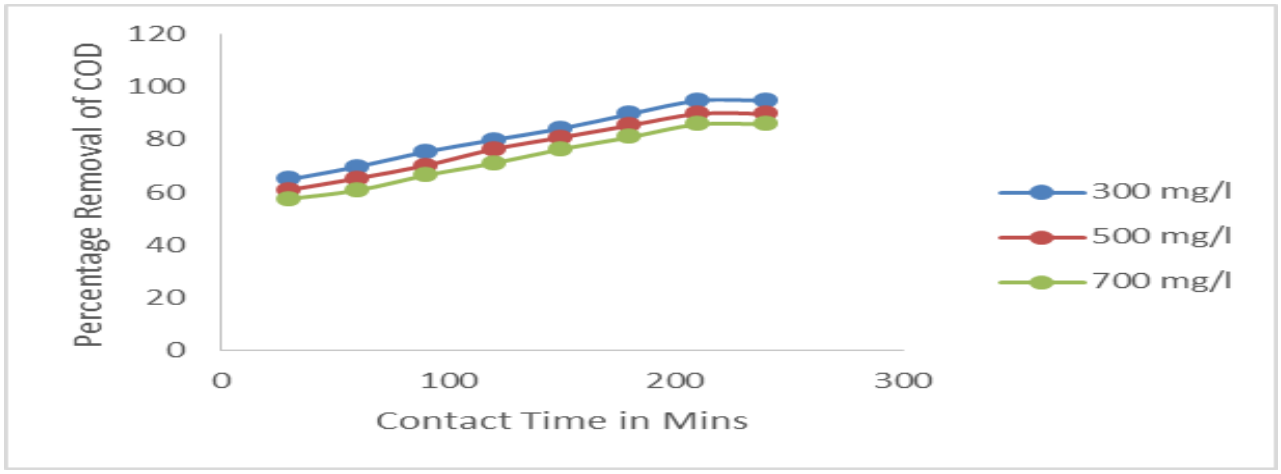

Figure 7 : Maize

Effect of Initial Concentration and contact time on percentage removal of COD by Maize. This maize blends is more effective than other blends.

Percentage removal of COD is rapid in all the 4 adsorbents for the first 150 mins and then it proceeds at slower rate and then it finally attains saturation and attains equilibrium. This happens because Initially the surface sites are available, so rapid adsorption takes place outside the surface but slower inside the pores.

As the initial concentration of wastewater was accelerated, the percentage removal of COD decreased from 87 to 60% (for Neem Leaves), 92 to 85% (for Coconut Husk), 86 to 79% (for Jamun Leaves), and 95 to 86% (for Maize), this may be due to thefact that initially, the surface sites are available, so adsorption take place rapidly at outer surface, with further increase in the initial concentration led to the faster saturation of surfaces of the above four adsorbents and adsorption took place slowly inside the pores.

Results :-

The sorbent Neem leaves has the lowest bulk density .The sorbent neem Leaves is highly soluble in moisture which causes colossal problems in maintenance and operation. The specific surface area is the highest in case of Maize, so the rate of adsorption is faster in case of Maize and number of active sites available are highest in case of Maize and it readily removes the pollutant from wastewater.
The average pore diameter and pore volume is highest in case of maize which in turn increases the rate of adsorption and also increases the number of active sites for adsorption.

Future scope :-

In the present research, only one of the parameter i.e. COD was taken into consideration for the removal from wastewater, one can consider other parameters viz. Total solids, BOD, TDS etc. for removal from wastewater by using the same adsorbents.

This study is devoid of Cost analysis and economics for the treatment of wastewater and adsorbent preparation, one can take this as research initiative and work on the same.

As blends give better result, so a separate research can be initiated for the same by trying different blend ratio of different adsorbents.

Conclusion :-

The method used over here was trial and error method as various blend ratio of mixes would have been tried but here only blend ratio were used of 4 sorbent (Neem Leaves, coconut husk, jamun leaves and maize) viz. 1:1:1:1, 2:3:4:5, 1.8:2.5:3.5:4.5. It was found that blends too give better results and are explicit and conclusive. The following can be inferred from here:

In all the cases at constant temperature adsorbent dose, initial concentration, pH and is attained in 180 mins and in some cases 100% of removal of COD is found with this blend.

Other blend ratios could have been tried but it would have increased the cost burden and also no doubt it would have given better results.

On comparing blends and parent adsorbent, the percentage removal is more and also the attainment of equilibrium occurs 30 mins earlier than the parent sorbent, which indicates that blends are better than the parent sorbents.

References :-

i. Ayhan, D., "Agricultural based activated carbons for the removal of dyes from aqueous solutions: A review", Journal of Hazardous Materials, Vol. 167, 2007, pp. 1-9.

ii. Babu, B. R., Parande, A,K., Raghu, S., and prem Kumar, "Cotton Science, Vol. 11, 2007,pp.141-153.

iii. Balci, B., Keskinkan, O., and Avci, M., "Use of BDST and an ANM model for prediction of dye adsorption efficiency of Eucalyptus camaldulensis barks in fixed-bed system", Expert System with Applications, Vol. 38, 2011, pp. 949-956.

iv. Bansal R.P. and Goyal M. (2005) Activated Carbon Adsorption, CRC Press, Taylor & Francis Group, 6000 Broken Sound Parkway NW, Suite 300 Boca Raton, FL, USA 33487–2742.

v. Barna S. F., Ott, E. A., Nguyen. T. H., Shannon, M. A., Scheeline, A., "Silica Adsorbents and Peroxide Functionality for Removing paraquat from Wastewater ", Journal of Environmental Engineering Vol. 139,2013, pp. 975-985.

vi. Basava Rao, V. V., Ram Mohan Rao, S., "Adsorption studies on treatment of textile dyeing industrial effluent by fly ash", Chemical Engineering Journal, Vol. 116, 2006, pp. 77-84.

vii. Baseri, J. R., Palanisamy, P. N., Sivakumar, P., "Comparative Studies of the Adsorption of Direct Dye on Activated Carbon and Conducting Polymer Composite", E-Journal of Chemistry, Vol. 9(3), 2012, pp. 1122-1134

viii. Belaid, K. D., Kacha, S., Kameche, M., and Derriche, Z., "Adsorption kineties of some textile dyes onto granular activated carbon", Journal Environmental Chemical Engineering, Vol. 1. 2013, pp.

ix. Buvaneshwari, n., and Kannan, C., "Adsorption of Anionic Organic Dyes from aqueous Solutions Using Silica", Journal of Environmental Science and Engineering, ASCE,Vol. 52(4), 2010, pp. 361-366

11% Overall Similarity

Top sources found in the following databases:

- 4% Internet database
- Crossref database
- 8% Submitted Works database
- 9% Publications database
- Crossref Posted Content database

TOP SOURCES

The sources with the highest number of matches within the submission. Overlapping sources will not be displayed.

1	Universiti Sains Malaysia on 2013-06-11 Submitted works	2%
2	A.M. Nandhu Lal, M.V. Prince, Anjineyulu Kothakota, R. Pandiselvam, R... Crossref	1%
3	Ramesh Dod, Goutam Banerjee, S. Saini. "Adsorption of methylene blu... Crossref	1%
4	apessay.elementfx.com Internet	<1%
5	Qazaleh Sadat Mirhashemi, Negar Nasiri, Mohammad Reza Keyvanpou... Crossref	<1%
6	Yasemen Kalpaklı, Şafak Toygun, Gülhan Köneçoğlu, Mesut Akgün. "Eq... Crossref	<1%
7	International Islamic University Malaysia on 2012-05-15 Submitted works	<1%
8	Milind S. Patil, Sanjay P. Shekhawat. "Estimation of Average Daily Sola... Crossref	<1%

9	jhs.mazums.ac.ir Internet	<1%
10	Australian Catholic University on 2021-08-20 Submitted works	<1%
11	Thapar University, Patiala on 2018-09-13 Submitted works	<1%