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This is to certify that our review board accepted research paper of Dr./Shri./Smt.:V. R. Jadhavar and P.A. Muddebhalkar Topic:-Use Of Charcoal Powder Prepared From orange And Lemon Peels for The Treatment Of Sewage Water At Nagothane Dist. Raigad. (M.S.), India. College:-Department of Chemistry, K.E.S.Anandibai Pradhan Science College, Nagothane, Raigad Maharashtra, India. The research paper is original & innovative it is done double blind peer reviewed. Your article is published in the month of March 2019.

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258/34. Raviwar Peth, Solapur-413005 Maharashtra India
Contact Detail: +91-0217-2372010 / 9595-359-435
E-mail: ayisrj2011@gmail.com
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Ashok Yakkaldevi
Ashok Yakkaldevi
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USE OF CHARCOAL POWDER PREPARED FROM ORANGE AND LEMON PEELS FOR THE TREATMENT OF SEWAGE WATER AT NAGOTHANE DIST. RAIGAD. (M.S.), INDIA

V. R. Jadhavar and P.A. Muddebhalkar
Assist. Professor, Department of Chemistry,
K.E.S. Anandibai Pradhan Science College, Nagothane,
Dist. Raigad, 402106. (Maharashtra), India.
Email: - vilas_jadhavar1974@rediffmail.com
poonammuddebhalkar@gmail.com

ABSTRACT

With the help of cheaply available charcoal powder made up from Orange and Lemon Peels, an experimental investigation was carried out for the treatment of sewage water at Nagothane, Dis. Raigad. The peels of these fruits were used to prepare charcoal powder and by filtering the sewage water sample through the bed of these powders and the effect of pH, Conductivity, Alkalinity, Turbidity, Hardness, DO, COD, Total Dissolved Solids etc. were analyzed. The effectiveness of treatment of sewage water with charcoal powder depends upon contact time with sewage water. Analysis showed that lemon peels are more effective than Orange peels for the removal of some pollutants in the sewage water. The uses of such easily and cheaply available peels are found to be effective for the removal of some parameters like pH, TDS, and COD from sewage water. The optimum contact time of the charcoal powder prepared from orange peel is 60 to 90 minutes. The optimum dose of orange peel is 1.5 g to 3.5 g and fine powdered particle size gives good results. Therefore it is concluded that this method can be adopted on commercial basis also and will be useful for local grampanchayat administration.

KEY WORDS – Nagothane, filtration, Orange peel, lemon peel, water quality.

I. INTRODUCTION:-

“Water quality” is a term used here to express the suitability of water to sustain various uses or processes. Any particular use will have certain requirements for the physical, chemical or biological characteristics of water; for example, limits on the concentrations of toxic substances for drinking water use, or restrictions on temperature and pH ranges for water supporting invertebrate communities. Water environment can be divided into surface and ground water. Surface water bodies include Rivers, lakes, streams, creeks etc. whereas ground water is present beneath earth’s surface in soil pores, stone fractures and aquifers. Quality of water plays an important role in determining its use for various purposes. Hence it becomes essential to study quality of water in these resources in order to evaluate any chances of contamination from anthropogenic or developmental activities: The Crises of water pollution by trace metal is now well known to be crucial all over the world and especially in a developing country like India, everybody is facing the problem of ever widening threat of water pollution due to advance modern Technology, industrialization, civilization and urbanization [6].

The sewage water is a combination of kitchen waste, washing and rinsing, bathing water which generates a lot of waste water which contain a very high concentration of organic and inorganic substances such as proteins, carbohydrates, lipids, oils, grease, etc. There are so many methods in practice to treat the waste water. However in the present study, an attempt was made to investigate the use of Charcoal Powder Prepared from Orange and Lemon Peels by using just simple filtration method for the Treatment of Sewage water.

II. MATERIAL AND METHODS

The orange and lemon peels waste material were collected from houses, then it is dried in sunlight for two to three days and powdered with the help of mixer. Then this powder was kept in oven for 200°C temperature for two hours till converted in fine powdered coal.

Sewage water samples were collected at Shantinagar (near to Forest office) in Nagothane. The water sample was collected in one liter pre-cleaned plastic cans using Niskin sampler. After collection samples were preserved with suitable preservatives and brought to the laboratory with utmost care.

Then analysis was carried out to determine the parameters like pH, Conductivity, Turbidity, Alkalinity, Hardness, DO, COD, Total Solids, Total Dissolved Solids etc. before the treatment of sewage water and after the treatment of sewage water through filtration with the help of charcoal powder bed in the Buchner funnel and by using standard methods [1, 2, 3, 8, 9].

Carbonization of Orange and Lemon peel:-

The peels of Orange and Lemon were collected and cut into small pieces, washed with pure water to remove the impurities. Then it was dried for 48 hours in an oven at 100°C to remove the moisture present in the peels. Then it was removed from the oven and cooled in desiccator and grinded into powdered form with the help of mixer. This powdered peel was then again kept in oven for two to three hours at 200°C to convert into charcoal form of fine powder [4, 5, and 7].

III. RESULT AND DISCUSSION

1. Effect of Contact time: -The optimum contact time of the charcoal powder prepared from orange peel is 60 to 90 minutes. The pollutant removal from sewage water increases gradually with increase in time of contact with carbon powder obtained from orange compared to lemon peel carbon powder. It is because that more time become available for the organic pollutant to stick on the surface of carbon powder obtained from orange peel with compare to lemon peel [5, 7].

2. Effect of Charcoal powder dose: -The optimum dose of Lemon peel is 1.5 g to 3.5 g and the removal of pollutant increased as the dose was increased.

3. Effect of particle size: -The fine powdered particles were used for the treatment of sewage water with charcoal powder obtained from orange and lemon peel and it gives good removal efficiency.

4. Difference in observed parameters of sewage water:-

It was observed from the result obtained in the table that most of the analyzed parameters which were increased before the treatment process were significantly decreased after giving the treatment to the sewage water by filtration and carbonization method. However we found that level of DO was much higher before the treatment process to the sewage water & it was slightly decreased after treatment process. Concentration above the permissible limit of DO can be harmful to the aquatic life. Fish in waters containing excessive dissolved gases may suffer from gas bubble disease. Therefore in sewage water fish cannot survive for more time.

The following table shows the removal efficiency of some physico-chemical parameters as

Sr.No.	Parameters	Before treatment mg/lit	After treatment mg/lit		Standard values mg/lit
			Lemon peel carbon	Orange peel carbon	
1.	pH	8.9	8.1	8.3	6.5-8.5
2.	Conductivity	950	700	850	300umhos/cm
3.	Alkalinity	300	300	250	200
4.	Turbidity	20	12	15	5-10NTU
5.	Hardness	830	200	350	300-600
6.	TDS	900	700	800	500
7.	DO	19.9	19.1	19.5	3-6
8.	COD	400	350	380	250

Pollutants from sewage water using carbon powder obtained from Lemon and orange peels.

IV. CONCLUSION:-

1. The carbonization with filtration method is found to be more efficient for both Orange and Lemon peels with better percentage removal of various pollutants.
2. This method is considered to be better because the carbon obtained from these peels is good oxidant and has pores structure which adsorbs the various organic pollutants to its surface somewhat easily.
3. The lemon peel is found to be more effective than orange peel. It is because of characteristic properties of lemon peel as it contains more fiber consisting of hydroxyl radicals having better removal capacity.
4. The uses of such easily and cheaply available peels are found to be effective for the removal of some parameters like pH, TDS, and COD from sewage water, which are important parameters for the determination of quality of water.
5. Therefore it is concluded that this method can be adopted on commercial basis also and will be useful for local gram panchayat administration, so that treated water can use for domestic and irrigation purposes.

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