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Rivulet water treatment of western Mumbai by Coconut Charcoal.

Dr.Bhushan Sonawane[1], Dr.P.N.Nemade [2]
[1](Atharva College of Engineering, Malad,Mumbai,India)
[2](Atharva College of Engineering, Malad,Mumbai,India)

Abstract : *Water scarcity is a critical problem throughout the world, so it is need to purify the waste water .The sources of waste water are kitchen waste, Industrial waste, washing of different types. By using certain important membranes that waste water can be purified and reused. Present work is based on easy method of coconut charcoal, which is made by simple heating and powdered form is used to filter water from different sources from western Mumbai. The important advantage is it purifies water, traps bacteria, pigments from waste water sample and that water used for gardening, for concrete work, for washing clothes or for street, railway Platform clearing.*
Keywords *: COD,BOD, Stations, Turbidity.*

I. Introduction

Charcoal of coconut is produced by heating wood or another organic substance in an enclosed container without air. Present research work is based on easy, cheap methods which may be useful to common people, hence it is the first simple technique of water filtration. Charcoal burns better than wood hence it is superior; hence it was acting as fuel historically.3750 B.C Charcoal was used to smelts ore. Sumerians Following are certain application where activated charcoal plays an important role. Air filter in gas masks, purification of gas , coloring of food , purification of gold, extraction of metals, finishing of metals, plants of nuclear power, solvent recycling, printing in commercial purpose, treatment of sewage, soil enhancement, soil which become toxic owing to spills of chemicals or spraying of chemicals, volatile

Coconut charcoal- This is one of most important product which can be obtained from shell of coconut. This charcoal can be used widely for domestic as well as industrial purpose .Blacksmith, goldsmith, laundries are the areas where,Coconut charcoal is applied .Activated charcoal cab be made from shall charcoal it absorb some molecular species. Shell can be carbonized by pit method drum method, destructive distillation etc.

Membrane Science:

Color of raw sugar is absorbed by charcoal powder. Charcoal has microcrystalline graphite particle size is so small to consider it as amorphous. The crystalline structure is of hexagonal network shape. Adsorption as well as absorption process depends upon particle size, surface area, pore structure, acidity (pH), Temperature etc. Small particles.are present in natural as well as waste water, which are suspended in water forms colloids.

Easy way of making activated charcoal:

Activated charcoal and activated coal are same words which are useful to remove toxins from waste water samples, due to its porous nature and high adsorption power. Because of its good adsorption and absorption natural, it is used in medicine and filters too. Though activated carbon is expensive but we can make activated carbon at home by a simple way.

How to reuse activated charcoal:

The charcoal which is used for cooking food in barbecue bit is totally different from activated charcoal. The absorptive and adsorptive power of activated charcoal is greater than normal charcoal .The porous form of activated charcoal makes it more beneficial. any (a) Backing out the odors and reactivity ,we can reuse activated charcoal for two three hours as the pores are completely blocked c)Blocked or outdated.

How to clean activated charcoal:

Used activated charcoal is taken into mesh kitchen strainer and warm water is forced through it to rinse all the impurities present in charcoal cavities continue the process for 2 to 3 minutes.

How to regenerate activated charcoal

* Activated charcoal is soaked into the solution of hydrogen peroxide about 10% or we can use distilled water (demonized) water. During this process we should use gloves for safety purpose.
Mixture is stirred randomly after 15 minutes.

* Once the solution absorbed by activated charcoal adds.

II. Methodology and actual working of the model

Water sample from station A, Station B, Station C, Station D was collected in 5 liter can and made air tight on every week end. Domestic waste water was initially taken with the help of sponge so that any solid or dirt particles are filtered and somewhat clean water was carried into lab where it is again filtered with the help of filter paper. and poured into respective containers viz Activated charcoal powder ,wet land pot, and sap wood pot.The water sample which comes through coconut charcoal was analyzed twice ,some time trice and the average readings of various parameters was taken and recorded into table .The filtered water sample was kept into clean sterilized bottles. Air tight bottle then send to some labs for bacteria, virus and BOD count, whose analysis was not possible into lab .Other parameters were checked into the Lab of Atharva College which was is approved by U.G.C. and AICTE, under the guidance of approved guide by JJTU.

III . Figures

Figures no 1: Process of formation of coal

IV. Tables

* Monsoon-(July-15 to Oct-15) / July-2015.
* Activated Coconut Shell Charcoal Filter- Membrane.
*Parameter-pH, Turbidity, Fe, Mg, Ca, Sulphate, Chloride, TDS, Alkalinity, Hardness, COD, BOD. I = Influent E = Effluent.

Table no 1: Monsoon-(July-15 to Oct-15) / July-2015

	PARAMETER	STATION -A (Bandra,Dadar,Mahim, Dharavi)		STATION -B Malad,Kandivali, Goregaon Area		STATION- C (Borivali, Dahisar, Gorai)		STATION -D (Virar, Vasai.) Bhyander)	
		I	E	I	E	I	E	I	E
July-2015	pH	7.11	7.09	7.39	7.19	7.01	7.00	7.3	7.21
	Turbidity	6.85	3.10	4.91	3.28	3.51	2.12	4.00	2.80
	Iron	1.02	0.31	0.9	0.4	0.38	0.16	0.5	0.2
	Magnesium	39	22	28	21	19	14	27	19
	Calcium	68	39	49	37	37	21	46	22
	Sulphate	57	53	45	44	29	23	48	47
	Chloride	61	58	42	41	34	32	49	48

In the July month pH values from various stations recorded which were in the range of 7 to 7.39 .The alues are in the permissible limit for drinking water as per I.S.10500.2012.
The Iron content was found highest in the Station A area while which was very less in case of Station C The reason behind it, must be presence of some small scale Industries situated in Dharavi area which is ituated in Bandra region.The the percentage of elements like Calcium, Magnesium also found to highes t in this month.

Table no 2: Monsoon-(July-15 to Oct-15) / July-2015 comparison

Monsoon	PARAMETER	STATION -A (Bandra,Dadar,Mahim, Dharavi)		STATION -B Malad,Kandivali, Goregaon Area		STATION- C (Borivali, Dahisar, Gorai)		STATION -D (Virar, Vasai.) Bhyander)	
		I	E	I	E	I	E	I	E
July-2015	TDS	398	341	255	249	158	197	253	231
	Alkalinity	572	334	420	200	313	173	401	210
	Total Hardness	102	61	75	41	69	39	78	40
	COD	29	13	23	11	18	06	21	09
	BOD	17	07	11	07	08	04	10	07

Raw water = Total Bacteria Count - 10^6 TBC/ml Escherichia Coli - Present
Filtered Water = Total Bacteria Count - 10^4 TBC/ml Escherichia Coli - Absent
Maximum of 68 mg/lit and 39 mg/lit in Sattion A and miniumum of 37 mg/lit and 10 mg/lit in Station C respectively.Sulphate and Chloride concentration is found to be 57 and 61 mg/lit as a maximum concentration and 29 and 34 mg/lit as lowest concentration in the same stations viz Station A and C respectively.
The values of TDS ,Alkalinity, Hardness ,COD And BOD are recorded which are found to be very less in the Gorai Borivali Dahisar area ie. Station C and Maximum in Bandra area

* Monsoon-(July-15 to Oct-15)/ August-2015.
* Activated Coconut Shell Charcoal Filter- Membrane.
*Parameter-pH, Turbidity, Fe, Mg, Ca, Sulphate, Chloride, TDS, Alkalinity, Hardness, COD, BOD. I = Influent E = Effluent.

Table no 3: Monsoon-(July-15 to Oct-15) / August-2015

	PARAMETER	STATION -A (Bandra,Dadar,Mahim, Dharavi)		STATION -B Malad,Kandivali, Goregaon Area		STATION- C (Borivali, Dahisar, Gorai)		STATION –D (Virar, Vasai.) Bhyander)	
		I	E	I	E	I	E	I	E
August-2015	pH	6.80	6.72	7.29	7.19	7.20	7.02	7.1	7.11
	Turbidity	6.71	4.7	4.81	3.18	2.97	1.99	4.10	2.80
	Iron	1.02	0.58	0.8	0.3	0.38	0.26	0.4	0.2
	Magnesium	32	23						
	Calcium	59	31	45	33	28	19	41	22
	Sulphate	57	53	48	48	21	20	38	38
	Chloride	54	54	46	46	29	29	41	41

In the present month the value of pH which was recorded of every station is found to be less as compare to July month.The reason behind this is because of high rain fall which increases the solubility and the concentration of hydrogen ion increases which ultimately decresases the pH values,which is observed as minimum of 6.80 in Station A area while 7.29 in station B area.As usual the values of Ca,Mg ,sulphate Cl ion concentration is found to be maximum in case of Statiion A and lowest in case of Station C.

Table no 4: Monsoon-(July-15 to Oct-15) / August-2015 comparison

	PARAMETER	STATION -A (Bandra,Dadar,Mahim, Dharavi)		STATION -B Malad,Kandivali, Goregaon Area		STATION- C (Borivali, Dahisar, Gorai)		STATION –D (Virar, Vasai.) Bhyander)	
		I	E	I	E	I	E	I	E
August-2015	TDS	463	401	239	223	153	147	245	220
	Alkalinity	581	371	419	199	239	129	379	201
	Total Hardness	109	51	77	40	63	43	73	40
	COD	27	11	19	10	19	10	27	11
	BOD	13	08	10	07	08	06	11	06

Due to monsoon season the values of TDS, Alkalinity, Hardness, is found to be higher in case of Station A and lower in Station C .TDS is 463 and 153 mg/lit in Station A and Station C respectively. The values of above parameters also changed as compare to July month in the station B and D.

* Monsoon-(July-15 to Oct-15)/ Sept-2015.
* Activated Coconut Shell Charcoal Filter- Membrane.
*Parameter-pH, Turbidity, Fe, Mg, Ca, Sulphate, Chloride, TDS, Alkalinity, Hardness, COD, BOD. I = Influent E = Effluent.

Table no5: Monsoon-(July-15 to Oct-15)/ Sept-2015.

	PARAMETER	STATION -A (Bandra,Dadar,Mahim, Dharavi)		STATION -B Malad,Kandivali, Goregaon Area		STATION- C (Borivali, Dahisar, Gorai)		STATION –D (Virar, Vasai.) Bhyander)	
		I	E	I	E	I	E	I	E
	pH	6.66	6.59	7.29	7.10	7.01	6.97	7.2	7.00
	Turbidity	7.20	5.82	4.81	3.18	3.81	3.01	4.11	2.80
	Iron	1.04	0.43	0.8	0.4	0.38	0.19	0.4	0.2
	Magnesium	39	21	26	20	18	16	25	18
	Calcium	68	41	45	35	31	20	40	19
	Sulphate	69	64	47	46	29	21	47	47
	Chloride	72	61	47	47	31	29	46	44

As compare to August month it is again found that the value of pH also changed at every station, while the parameters like TDS, COD, and BOD also changed .The value of pH is found to be in the range of 6.6 to 7.29 .Turbidity in the range of 3.01 to7.20. Maximum value is observed in Station A, while which very less i.e 3.18 in case of Station C.The COD and BOD values are observed which are in the range of 21 to 31 and 10 to 15 respectively. The values which are observed in case of filtered water are under permissible limit and that water can be used for washing, clothing purpose

V. Conclusion

The conclusion of the research paper is, through activated charcoal water which we obtain is fine and it can be applied for gardening, construction working .It is easiest and simple technique of water purification.As such we are throwing charcoal shell or cover after use but by making simple charcoal we can reuse it.

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