International Journal of Advanced Research in Education and TechnologY(IJARETY)

| ISSN: 2394-2975 | www.ijarety.in| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 3, Issue 2, March 2016 ||

Vibration and Noise Reduction of Terry Towel Machine of Selected Mechanism

Shital P. Udagave, Prof (Dr). V.R.Naik

Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India

ABSTRACT: Generally, the Industrial waste effluents are causing more pollutants in the river course since they are being discharged without appropriate treatment. The effluents may be organic or inorganic nature. To adopt a suitable treatment for the industrial effluents they have to be examined. For that we have to use Activated carbon for treating of industrial waste water by variation of dosages. Activatedcarbon was produced from a weed called partheniumhysterophous from this plant we have produced Activated carbon to treat industrial waste water (paper &tannery), these water samples are collected from TNPL-KARUR&AMBUR. These water samples are analyzed for PH, turbidity, BOD&COD before treatment by using Activated carbon. The treatment was done for 7 days in varying dosages. After treatment, the treated water samples are analyzed for pH, turbidity, BOD &COD. This test was conducted to determine the influence of Activated carbon will decrease the above parameters. The results thus obtained shows us that the pH value of treated water tend to acquire neutral value compared to pH value of pre-treatment of sample which is basic in case of paper and acidic in case of tannery.

KEYWORDS: Partheniumhysterphous, waste waters1.paper(TNPL-KARUR),2.TANNERY-AMBUR, Activated carbon.

I. INTRODUCTION

Activated carbon is also called as activated charcoal, is a process of carbon processed to have small low-volume pores that increase the surface area available for adsorption or chemical reactions. Due to its high degree of micro porosity, just one gram of activated carbon has a surface area in excess of 32,000 sp.ft as determined by gas adsorption. Activated charcoal is a potent natural treatment used to trap toxins and chemicals in body does not re absorb them. Activated carbon works by trapping toxins and chemicals by its millions of tiny pores. Typically, however it's not used when petroleum, alcohol, lye, acids or other corrosive poisons are ingested. It doesn't absorb the toxins, however. Instead it works through the chemical process of adsorption. In the body, absorption is the reaction of elements, including nutrients, chemicals and toxins, soaked up and assimilated into the blood stream. Adsorption is the chemical reaction where elements bind to a surface. The porous surface of activated charcoal has a negative electric charge that causes positive charged toxins and gas to bond with it

Properties

- Activated carbon does not bind well to certain chemicals, including alcohols, diols, strong acids and bases, metals and most inorganics, such as lithium, sodium, iron, lead, arsenic, fluorine, and boric acid.
- Activated carbon adsorbs iodine very well. The iodine capacity, mg/g, (ASTM D28 Standard Method test) may be used as an indication of total surface area.
- Carbon monoxide is not well adsorbed by activated carbon. This should be of particular concern to those using the material in filters for respirators, fume hoods or other gas control systems as the gas is undetectable to the human senses, toxic to metabolism and neurotoxic.
- Activated carbon can be used as a substrate for the application of various chemicals to improve the adsorptive capacity for some inorganic (and problematic organic) compounds such as hydrogen sulfide (H_2S), ammonia (NH_3), formaldehyde(HCOH), mercury (Hg) and radioactive iodine-131. This property is known as chemisorption.

Types of Activated Carbon

1. Powdered activated carbon (R 1, PAC)
2. Granular Activated Carbon (GAC)
3. Extruded Activated Carbon (EAC)
4. Bead Activated Carbon (BAC)
5. Impregnated carbon
6. Polymer coated carbon

Environmental applications

Carbon adsorption has numerous applications in removing pollutants from air or water streams both in the field and in industrial processes such as:

1. Spillcleans-up 2. Groundwater remediation 3. Drinking water filtration4. Air purification

Parthenium Hysterophorus

Parthenium hysterophorus is a species of flowering plant in the aster family, Asteraceae. It is native to the American tropics. Common names include Santa Mariafeverfew, white top weed, famine weed, and congress weed. In India, it is locally known as carrot grass**,** congress grass or Gajar Ghana. It is a common invasive species in India, Australia, and parts of Africa. Partheniumhysterophorus invades disturbed land, including roadsides. It infests pastures and farmland, causing often disastrous loss of yield, as reflected in common names such as famine weed. In some areas, heavy outbreaks have been ubiquitous, affecting livestock and crop production, and human health. As an invader it first appeared as a contaminant t in imported wheat. The plant produces Allopathic chemicals that suppress crop and pasture plants, and allergens that affect humans and livestock. It also frequently causes pollen allergies.

Paper Industry Waste Water

Paper requires large amount of energy and water to produce the paper products we use in our daily events. The resultant waste water must be carefully managed. at many pulps and Paper mills, an aerobic treatment is well established, but because of chemical thermo mechanical process used in the industry. This waste water has high organic strength and many contained compounds that make it difficult to treat.

Tannery Industry Waste Water

Tanning is an industry from prehistoric times and to the familiar with them, the waste from the industry presents many Neolithic Characteristics, notably a disagreeable appearance, a bad smell and a high degree of intractability. Despite the best efforts of its chemists, the industry still remains in many respects an art, resistant to exact technical control. Ambur, an industrial town in the state of Tamil Nadu, is one of the important leather tanning centres in India. There are about 90 tanneries operating in and around this town. To treat the wastewater from these tanneries two common effluent treatment plants and several individual effluent treatment plants have been constructed and are operational. Of these, the common effluent treatment plant managed by Ambur Tannery Effluent Treatment Company Limited, AMBURTEC in short, is located at Thuthipet, about 8 km from Ambur on the AmburPernambut road. The CETP is managed by AMBURTEC, a company formed by the 49 tanners who are its members. The company is registered under the Indian Companies Act and managed by a BoD, drawn from its members.

II. METHODOLOGY

II.I PREPARATION OF ACTIVATED CARBON

The dried Parthenium stem were kept in an oven contained in an air tight container (desiccator) with Conc. Sulphuric acid of 1.5 times the volume of stems so that stems get submerged in the acid.it was kept at 124 deg Celsius for 24 hours then the stems were washed in distilled water to remove free acid and soaked with 1%of sodium bi carbonate solution over night to remove the residual acid. Again the stems were washed with distilled water and kept at oven for 105° in an oven for a day. Activated carbon was thus prepared by this method with an efficiency of 65%.

(a)

(b)

Fig. 1. Preparation of Activated Carbon (a) Before addition of Acid (b) After addition of Acid

II.IIANALYSIS OF COLLECTEDWASTE WATER SAMPLES

The collected tannery and paper industries waste water samples were inspected for its physical and chemical parameter. A total of 4 tests were conducted on these samples to study their parameters before treating with Activated Carbon. The 4 tests were

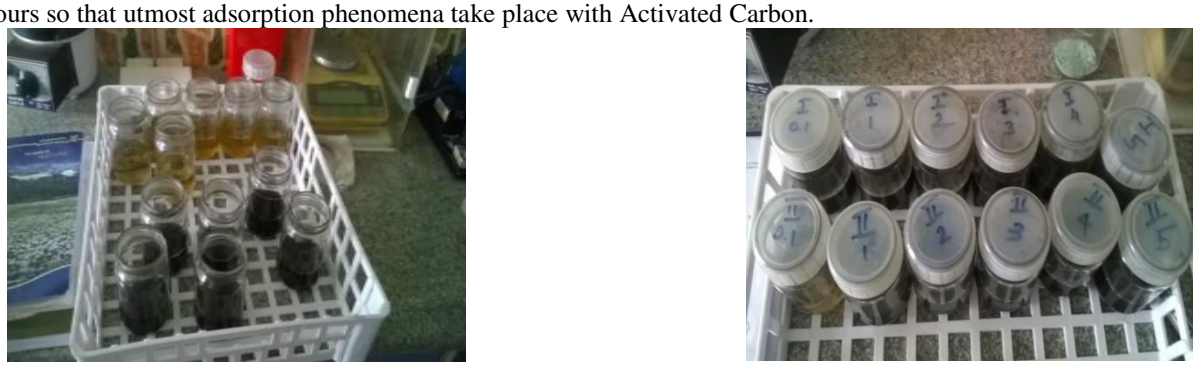
1. PH
2. Turbidity
3. BOD
4. COD

(a) (b)

Fig. 2 Testing of Samples for Physical and Chemical Parameters (a) Check for Turbidity value (b)Collection of Sample for COD

II.III TREATMENT OF INDUSTRIAL WASTE WATER SAMPLES

The prepared Activated Carbon was thoroughly mixed with Tannery and Paper Industries waste water samples in varying dosage (1mg,2mg,3mg,4mg,5mgand1gm). These samples were continuously shaken on a Magnetic shaker for 2 hours so that utmost adsorption phenomena take place with Activated Carbon.



(a) (b)

Fig. 3. Samples Containing Activated Carbon with different Dosages (a) Before addition Activated carbon (b) After addition of Activated Carbon

II.IV ANALYSIS OF TREATED WASTE WATER

The treated waste water samples were again inspected for their physical and chemical parameters to study their treatment with Activated Carbon. The tests were conducted eventually day wise for a week and treatment was studied.

II.V CHEMICAL OXYGEN DEMAND (COD)

The chemical oxygen demand (COD) test is commonly used to indirectly measure the amount of organic compounds in water. Most applications of COD determine the amount of organic pollutants found in surface water (e.g. lakes and rivers), making COD useful measure of water quality. It is expressed in milligrams per liter (mg/l), which indicates the mass of oxygen consumed per liter of solution. COD is the measurement of the amount of oxygen in water consumed for chemical oxidation of pollutants. COD determines the quantity of oxygen required to oxidize the organic matter in water or waste water sample, under specific conditions of oxidizing agent, temperature, and time. This method covers the determination of COD in ground and surface waters, domestic and industrial wastewaters. The applicable range is 3-900 mg/l.

| ISSN: 2394-2975 | www.ijarety.in| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 3, Issue 2, March 2016 ||

III. RESULTS AND DISCUSSION

III.I BEFORE TREATMENT

III.I.I SAMPLE-I TANNERY INDUSTRY

PH	TURBIDITY(NTU)	BOD(mg/l)	COD(mg/l)
8.45	33.13	160	110

Table 1. shows the before treatment results of Tannery industry sample

III.I.II SAMPLE-II PAPER INDUSTRY

PH	TURBIDITY(NTU)	BOD(mg/l)	COD(mg/l)
3.5	56.51	352	203

Table 2. shows the before treatment results of Paper industry sample

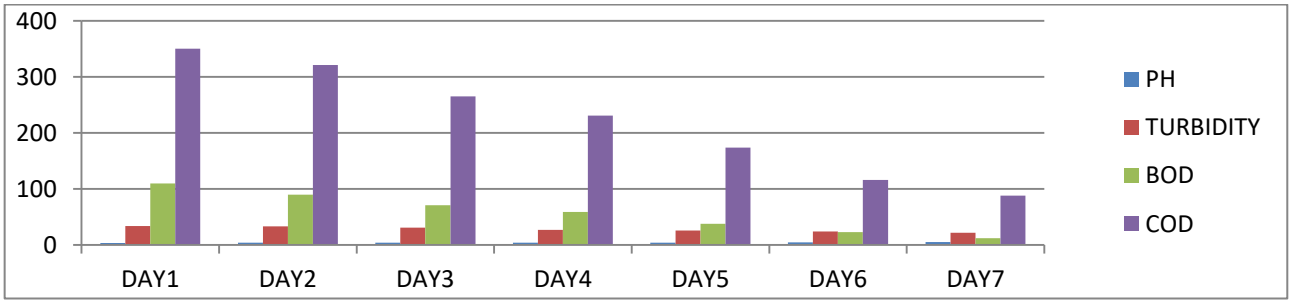
III.II AFTER TREATMENT

III.II.I SAMPLE-I TANNERY INDUSTRY

III.II.I.I for 2gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/l)	COD (mg/l)
2gm/lit	1	3.54	33.56	110	350
	2	3.88	33.12	90	321
	3	4.03	31.11	71	265
	4	4.21	27.13	59	231
	5	4.38	25.65	38	174
	6	4.62	23.91	23	116
	7	5.03	21.79	12	88

Table 3. shows the after treatment results of Tannery industry sample for 2mg/lit dosage



Graph 1. shows the after treatment of sample with gradual decrease in values w.r.t days

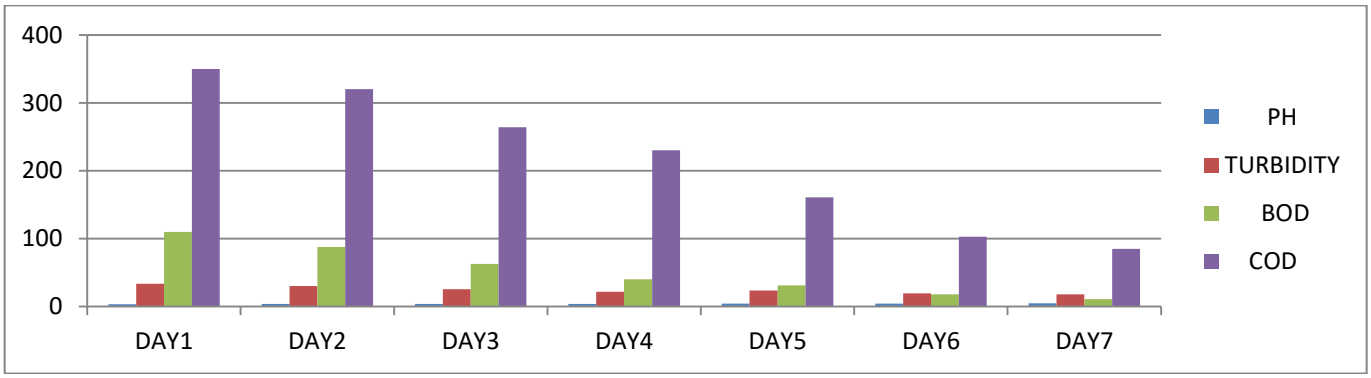
III.II.I.II For 5gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/l)	COD (mg/l)
5gm/lit	1	3.54	33.48	110	350
	2	3.69	30.5	88	320
	3	3.75	25.71	63	264
	4	3.91	22.01	40	230
	5	4.23	23.53	31	161
	6	4.39	19.45	18	103
	7	4.64	18.16	11	85

Table 4. shows the after treatment results of Tannery industry sample for 5mg/lit dosage

| ISSN: 2394-2975 | www.ijarety.in| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 3, Issue 2, March 2016 ||

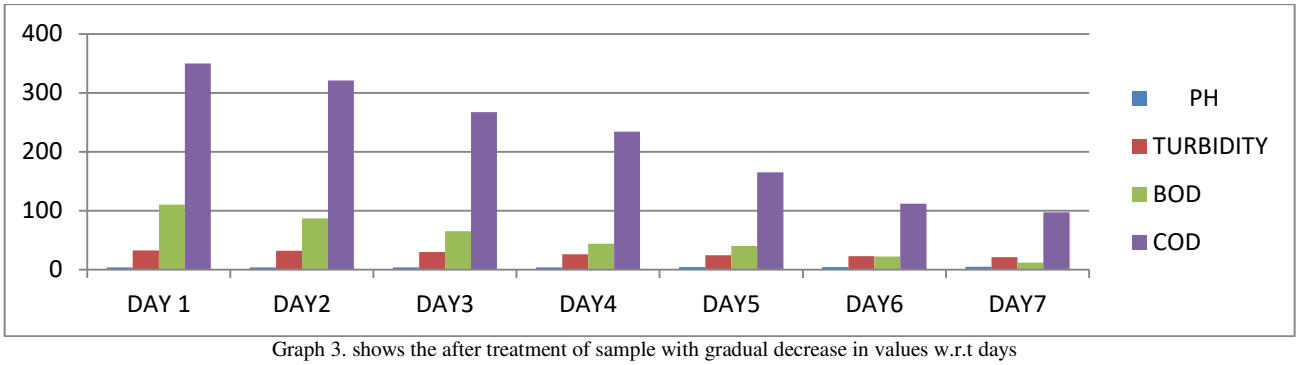


Graph 2. shows the after treatment of sample with gradual decrease in values w.r.t days

III.II.I.III For 10gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/l)	COD (mg/l)
10gm/lit	1	3.54	32.48	110	350
	2	3.62	31.65	87	321
	3	3.68	29.87	65	267
	4	3.79	26.01	44	234
	5	4.09	24.53	40	165
	6	4.32	22.45	22	112
	7	4.54	21.16	12	97

Table 5. shows the after treatment results of Tannery industry sample for 10mg/lit dosage



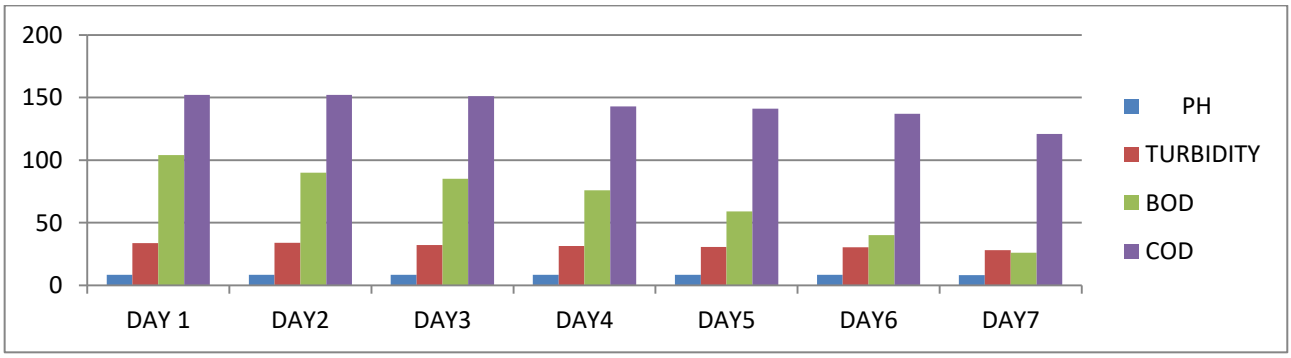
Graph 3. shows the after treatment of sample with gradual decrease in values w.r.t days

III.II.II SAMPLE-2 PAPER INDUSTRY

III.II.II.IFor 2gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/l)	COD (mg/l)
2gm/lit	1	8.53	33.81	104	152
	2	8.49	34.1	90	152
	3	8.48	32.15	85	151
	4	8.48	31.39	76	143
	5	8.40	30.76	59	141
	6	8.32	30.53	40	137
	7	8.27	28.17	26	121

Table 6. shows the after treatment results of Paper industry sample for 2mg/lit dosage

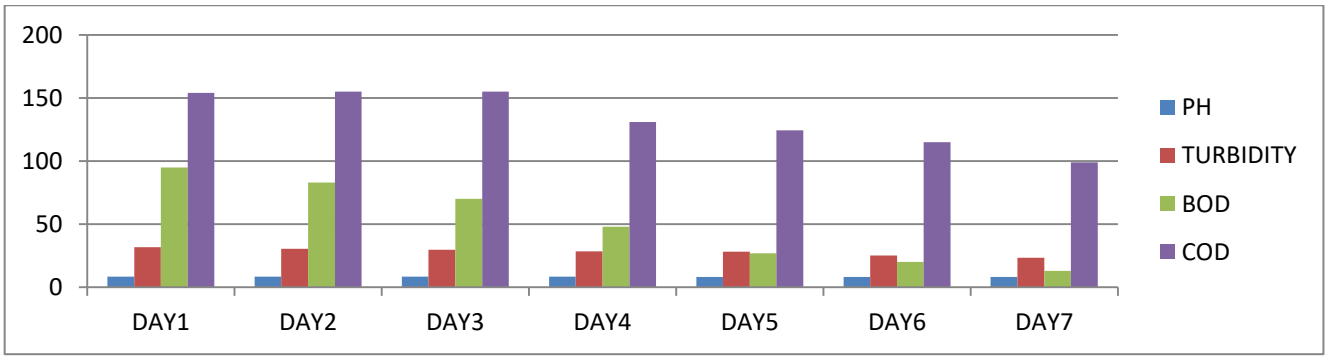


Graph 4. shows the after treatment of sample with gradual decrease in values w.r.t days

III.II.II.IFor 5gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/l)	COD (mg/l)
5gm/lit	1	8.45	31.69	95	154
	2	8.45	30.38	83	155
	3	8.37	29.65	70	155
	4	8.34	28.41	48	131
	5	8.26	28.12	27	124.2
	6	8.23	25.09	20	115
	7	8.23	23.4	13	99

Table 7. shows the after treatment results of Paper industry sample for 5mg/lit dosage



Graph 5. shows the after treatment of sample with gradual decrease in values w.r.t days

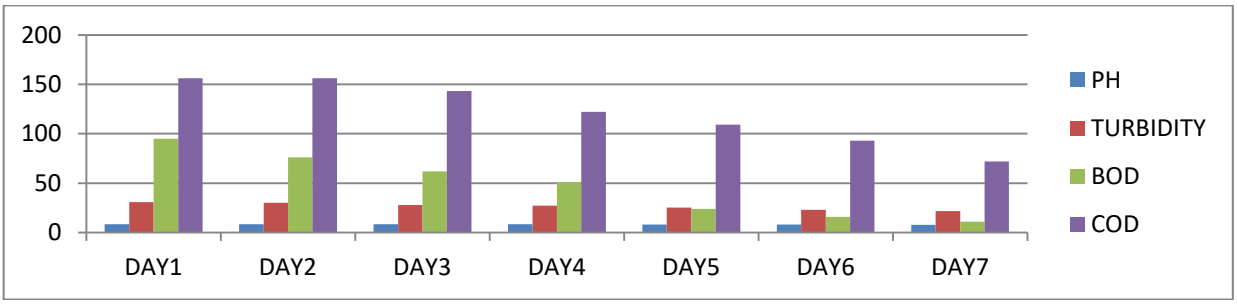
III.II.II.IIIFor 10gm/lit

DOSAGE OF ACTIVATED CARBON	RETENTION TIME(IN DAYS)	pH	TURBIDITY (NTU)	BOD (mg/lit)	COD (mg/l)
10gm/lit	1	8.49	30.68	95	156
	2	8.34	30.21	76	156
	3	8.31	27.76	62	143
	4	8.32	27.34	51	122
	5	8.20	25.4	24	109
	6	7.99	23.1	16	93
	7	7.86	21.6	11	72

Table 8. shows the after treatment results of Paper industry sample for 10mg/lit dosage

| ISSN: 2394-2975 | www.ijarety.in| A Bi-Monthly, Double-Blind Peer Reviewed & Referred Journal |

|| Volume 3, Issue 2, March 2016 ||



Graph 6. shows the after treatment of sample with gradual decrease in values w.r.t days

III.III DISCUSSION

- By referring to the above results we can come to a conclusion that both the waste water have been considerably treated with the Activated carbon
- The Varying dosages/concentration of Activated carbon in the waste water resulted in comparatively greater results.
- The pH value of treated water tend to acquire neutral value compared to pH value of pre-treatment of samples which is basic in case of paper and acidic in case of tannery.

IV. CONCLUSION

1. By comparing to the above results we can come to a conclusion that both the Paper and the Tannery industry waste water have been considerably treated with the Activated carbon.
2. The turbidity value has considerably decreased after treating with Activated carbon.
3. Both COD and BOD value also got decreased after treating with the activated carbon.
4. Hence, complete treatment of waste water could be done using Activated carbon which is prepared from parthenium plant.
5. Greater treatment and higher tendency of treating the waste water depends upon dosage and duration of days in treatment.
6. The adsorption capacity of Activated carbon depends upon complete saturation with which waste water was obtained by shaking solution in a Magnetic shaker for about 24 hours completely.

REFERENCES

1. Low-Tech Coconut Shell Activated Charcoal Production: Ami Cobb, MikellWarms, Dr.Edwin P. Maure, Dr.Steven Chiesa, International Journal for Service Learning in Engineering, Vol. 7, No. 1, pp. 93-104, Spring 2012 ISSN 1555-9033.
2. PartheniumHysterophorus: Novel adsorbent for the removal of heavy metals and dyes, S.A. Bapat, D.K. Jaspal, Global J. Environ. Sci. Manage., 2(2): 135-144, Spring 2016 DOI: 10.7508/gjesm.2016.02.004.
3. Bhatia.S.C “Handbook of industrial pollution control” (vol I).
4. Datta.A.K&Rao.M.N”Waste water treatment “Oxford and IBH Publishers.
5. Activated carbon from Parthenium as adsorbent Adsorption of Hg(II) from aqueous solution: K. Kadirvelu, C. Sivasankari, M. Jambulingam, S. Pattabhi. eIndian Journal of Chemical Technology, Vol. 9, November 2002, pp.499-503.
6. Kotaiah.B and Kumaraswamy.N”Environmental Engineering Laboratory Manual” Charotar Publishers,.
7. A Manual on Water &Waste Water Analysis NEERI, Nagpur (1988).
8. Punmia.B.C “Waste Water Engineering”.
9. Ravindra Singh, SadhanaChaurasia, Anand Dev Gupta, PrabhatSoni “Studies on effect of Partheniumhysterophorus plants extract on germination and growth in certain pulses” Scholarly Journal of Agricultural Science, Vol. 4(4), pp. 235-239 April, 2014
10. Sudhir K. Upadhyay, Mustaqeem Ahmad, Anshu Singh “Ecological Impacts of Weed (Partheniumhysterophorus L.) Invasion in Saline Soil” International Journal of Scientific and Research Publications, Volume 3, Issue 4, April 2013 1 ISSN 2250-3153.
11. Steve W. Adkins, Chris O’Donnell, Naeem Khan, Thi Nguyen, AsadShabbir, KunjitapathamDhileepan, Doug George1 and Sheldon Navie ”Parthenium weed (research in Australia: new management possibilities” Seventeenth Australasian Weeds Conference.
12. Anil Kumar “Partheniumhysterophorus and its impact on Living world”Indian J.Sci.Res.4 (1): 08-14, 2014