International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958 (Online), Volume-9 Issue-1S4, December 2019

Examination of Advanced Treatment Technologies for Textile Dye Wastewater

S.Rajesh, R.Premkumar

Abstract: *The worldwide population is developing and along these lines, the world may event incredible freshwater shortage. Our water assets are lacking and, thus, water management and reusing techniques are the main choices for receiving freshwater later on decades. Accordingly, there is an incredible requirement for the advancement of proper, reasonable and quick wastewater. The common plan of this investigation is based on assessment and comparison, of the chance of apply advanced treatment techniques (Aeration process and Fenton oxidation process) for the exclusion of residuals organic pollutant present in Dye wastewater. The various procedures, which influence the compound oxidation, for colors in their fluid arrangements are considered by utilizing Aeration and Fenton's responses. These Processes are Aeration and Fenton Oxidation Process- (Hydrogen peroxide dose). Finally, EC, COD, BOD, Turbidity, TDS, TSS, and Phosphate, when the oxidation procedure is determined to guarantee the flawless obliteration of natural colors during their expulsion from wastewater. The Compared optimum conditions were 6ml/l of Fenton (H_2O_2) demonstrate that Fenton's oxidation procedure effectively accomplished excellent evacuation capability.*

Keywords: ***Aeration; Fenton, Organic pollutant, Oxidation process, Textile dye wastewater.***

I. INTRODUCTION

Industrialization assumes a significant job in the advancement of any nation. The material business is an indispensable and rapidly rising modern fragment in India The material business utilizes various assets/crude materials, for example, cotton, woolen, and manufactured filaments. Cotton based material ventures are considered in this investigation. The material ventures can likewise be ordered into two gathering's vise arid textile industry. Solid wastes are delivered in wet surface organizations. Every material industry in the last classification is considered in this investigation. Preparing activity, for example, de-estimating, scouring, fading, mercerizing, coloring, printing and completing stages are incorporated in the wet texture handling industry, during texture arrangement, the water usage and wastewater age from a wet preparing material industry rely on tasks. (Chandrakant R Holkar et al., 2016).The textile industry is a fundamental maker emanating wastewater because of an additional utilization of water for its distinctive soaked allotment activities. This emanating wastewater contains synthetic compounds like sulfonic acids, amino, OH^-, HOOH, $(C_6H_{10}O_5)_n$, CHNaO, scattering agents and Ca, Zn Stearate metals (Paul et al.2012). Thus as far as its ecological effect, the fabric industry is evaluated to utilize more water than some other industry, worldwide and practically the entire wastewater released is exceptionally contaminated. Normal measured material factory expends water around 200 L for each kg of texture handled every day (Wang et al., 2011) According to the world bank assessment, material coloring and completing treatment are given to a surface generate around 17 to 20 percent of modern wastewater (Kant et al., 2012). In Bharat, the textile manufacturing expands around 80% of the absolute generation of 1,30,000 tons of dyestuff, because of intense interest for polyester and cotton, internationally. These colors in wastewater truly impact photosynthetic limit in the plant (Naik et at., 2013). They likewise affect aquatic life because of little light infiltration and oxygen utilization. They may similarly be fatal to explicit sorts of marine life as a result of the occasion of part metals and Cl. Suspended particles be able to stifle fish gills and murder them. They additionally identified to upset certain metropolitan wastewater treatment activities, for example, bright cleaning, etc. (Mazumber et al.,2011). At here, fragrant and heterocyclic colors are warned in the textile industry. The mind-boggling and steady structure of color is artificiality more prominent trouble in debasement when current in dye wastewater as well as in any sort of multipart matrix. The mineralization of colors, natural mixes and consequently the poisonous quality of the wastewater created by the textile industry and colors fabricating industry is a fundamental test and an environmental concern. Thus, accepting and rising genuine dye wastewater treatment environmentally note worth. (Ding et al., 2010)

Hence, the principle point of this paper is to Compare propelled treatment innovations in dye wastewater. This examination additionally clarifies the most by and large utilized techniques of color expulsion from dye modern effluents.

II. TREATMENT METHODOLOGY

A. Waste water Treatment and technology

The choice of the treatment advancements relies upon the kind of wastewater and the necessities (wealth part). Incredibly polluted water having shading and contain with solid waste is primary treated with essential and optional procedures pursued by the pre-final water treatment innovation. If that the BOD is insignificant, at that point an auxiliary procedure isn't required. In the event that the water is dull with no solids and it is dirtied because of inorganic, natural and organic toxins, therefore pre-final water treatment is obligatory.

Manuscript published on 30 December 2019.
* Correspondence Author (s)
S.Rajesh*, Department of Civil Engineering, Kalasalingam Academy Research & Higher Education, Krishnankoil,, India. Email: srajesh@klu.ac.in,rajeshkvm88@gmail.com
R.Premkumar, Department of Civil Engineering, Kalasalingam Academy Research & Higher Education, Krishnankoil,, India. Email: rpremkumar@klu.ac.in

Usually, groundwater is contaminated by dangerous cationic and anionic particles, and just tertiary water innovation is essential for its treatment. Oppositely, surface water tainted by in-organic, natural and organic toxins, requires optional and pre-final treatment techniques. For the most part, wastewater is exceedingly dirtied and it might be hued with strong waste contain inorganic, natural, organic contaminations, which requires a decent hyphenation of essential, auxiliary and tertiary treatment advances (Vinod Kumar Gupta et al.,2012). The decision of the pre-final water treatment innovations relies upon the sorts of the poisons current in the water and the most invaluable determination should be possible by considering the Aeration and Aeration with Fenton Technologies are discussions.

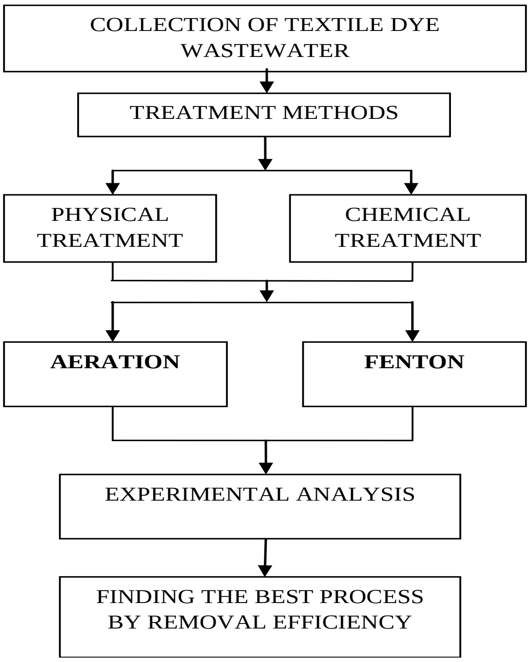

Fig.1.Methodology flow Chart

i. Advanced Oxidation Process (AOP)

Propelled oxidation procedures are described by the creation of $OH^{\bullet}$ radicals and suitability of a hit which is a valuable viewpoint for an oxidant. The creativeness of *AOP* is likewise improved by the-way that offer various potential ways for $OH^{\bullet}$ radicals. A rundown of the various conceivable outcomes offered by AOP is given in Table 1 (Roberto Andreozzi et al., 1999). The Creation of $HO^{\bullet}$ is usually quickened by consolidating Ozone, Hydrogen Peroxide, Titanium dioxide, Ultraviolet radiation, electron-pillar light, and ultrasound. Of these, Ozone (O_3) / Hydrogen Peroxide (H_2O_2), Ozone (O_3) /Ultraviolet radiation, and Hydrogen Peroxide (H_2O_2)/Ultraviolet radiation grip the most guarantees to oxidize dye wastewater.

ii. Aeration Technology

Aeration gets water and sealed area contact to expel broke up gases, (for example, CO_2) and disintegrated corrosion incubators, (for example, Fe, H_2S), and unstable natural-synthetic compounds (VOCs). Aeration is every now and again prepared at the treatment plant. During aeration, the constituent is disconnected or adjusted facing they can meddle with the treatment forms. Aeration acquires air and water close make contact with by exciting drops or slender sheets of water to the air or by presenting little air pockets of atmosphere and renting them ascend throughout the water. The cleaning procedure brought about by the disturbance of aeration expels broke up gases from the arrangement and enables them to run away into the neighboring atmosphere.

Table- 1: Advanced oxidation processes

1.H_2O_2/UV/Fe^{2+} (photo-assisted Fenton)
2.H_2O_2/Fe^{2+} (Fenton)
3.Ozone/UV(likewise pertinent in the gas stage)
4.Ozone/H_2O_2
5.Ozone /UV/H_2O_2
6.Ozone/TiO_2/Electron–bar light
7.Ozone/TiO_2 /H_2O_2
8.Ozone + electron-bar light
9.Ozone/ultrasonic's
10. H_2O_2 /UV

Aeration additionally helps expel broke up metals from side to side oxidation, the synthetic blend of oxygen from the air with convinced unwanted metals into the water. When corroded, these synthetic substances drop out of the arrangement and grow to be particles into the water and preserve be evacuated by filtration or buoyancy. The viability of aeration relies upon the measure of face touch among air and water; it is restricted basically by the measure of the water drop or air bubble. Oxygen is added to water during air circulation and can expand the discernible quality of water by expelling the level of quality. The measurement of oxygen the water can hold depends generally on the temperature of the water. Water to contain unnecessary measures of oxygen can turn out to be incredibly destructive. Unreasonable oxygen can likewise source issues for example air authoritative of channels. (www.mrwa.com)Constituents normally influenced by air circulation are:

- Volatile natural-synthetic substances, for example, benzene or trichloroethylene, dichloroethylene, and perchloroethylene
- NH_3
- Cl
- CO_2
- H_2S
- CH_3
- Fe & Mn

iii. Fenton Oxidation Technology

Fenton's Process is a basic strategy to deliver HO• coming up short on the requirement for neither extraordinary contraption nor synthetics and happens at encompassing temperature and weight. This strategy is a shrewd route for rust, as H_2O_2 and Fe^{3+} salts are effectively accessible, simple to deal with and naturally sheltered. The devastation of natural mixes happens by responding with the HO•. Condition 1 demonstrates how the HO• is framed:

$$Fe^{2+} + H_2O_2 \rightarrow Fe^{3+} + OH^{-} + HO^{\bullet} \text{ - (1)}$$

The pace of corrosion of natural contaminations with fenton–fenton similar to reagents is firmly quickened by illumination with UV light at wavelengths more prominent than 300nm. The photo-catalysis of Fe^{3+} edifices permits Fe^{2+} to be recovered. The event of Fenton responses within the sight of H_2O_2 has appeared in condition 2.

Retrieval Number: A10281291S419/2019©BEIESP
DOI:10.35940/ijeat.A1028.1291S419
Journal Website: www.ijeat.org

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

$Fe(OH)_2 + h\nu \rightarrow Fe^{2+} + HO\bullet + OH^- $ - (2)

Propelled oxidation pre-treatment utilizing Fenton reagent is powerful at improving the degradability of wastewater. The Fenton, photograph fenton, and fenton-like strategies are well-known techniques for *AOP* because of their flexibility, straightforwardness, and mix into obtainable water remediation procedures, for example, coagulation (unit operation). Moreover, this strategy has a quick response among iron and H_2O_2, which at that point creates HO• in the briefest time contrasted with different AOPs. The ideal measure of H_2O_2 for this procedure should be resolved since any overabundance H_2O_2 responds with other non-living issues, influencing the COD decrease.

As of recently, fenton and photo-fenton procedures have been utilized to treat wastes from color and concoction fabricating, mash dying, and rural preparing. Moreover, Fenton pre-treatment can be utilized to upgrade organic wastewater treatment. Since this procedure is considered as simple to-deal with, Fenton's response has exhibited to be progressively productive as far as working costs for the treatment of harmful and sustenance modern textile wastewater.(Krishnan et al.,2016).

C. Textile Waste water Treatment

Composite textile wastewater is portrayed primarily by the quality of biochemical oxygen demand (BOD), chemical oxygen demand (COD). Commonplace attributes of material industry wastewater are exhibited in Table 2. Results in Table 2 demonstrate a huge degree of variety from plant-to-plant. As displayed in Table 1(Adel Al-Kdasi et al., 2004). COD estimations of composite wastewater are outstandingly high contrasted with different parameters.

Table- 2: Composite Textile Industry Wastewater Characteristics

S.no	Parameters	Value
1	pH	7.0-9.0
2	BOD(mg/l)	80.0-6000
3	COD(mg/l)	150-12000
4	TDS(mg/l)	15-8000
5	TSS(mg/l)	2900-3100
6	Turbidity(NTU)	80-800
7	Electrical Conductivity(μs/m)	300-1000
8	Total Kjeldahl Nitrogen(mg/l)	70-80

As a rule, BOD/COD proportion of the blend of material wastewater is around 0.25 that infers that the wastewater contains a colossal measure of non-biodegradable natural issue.

D. Experimental Work

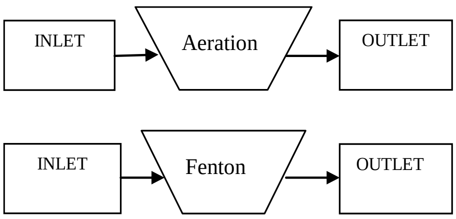

Fig.2. Experimental flow Chart

i. Aeration Process

Aeration is the strategy by which air is scattered through, blended with or broke down in a fluid or substances it given to speed up the reaction, it is to given the oxygen to react with the pollutants. Aeration is used in liquid soil and foods to improve the quality and reduce the contaminants. One of the major objectives of aeration is to take out carbon dioxide. Aeration gets water and air close contact so as to evacuate broke down gasses, (for example, carbon dioxide) and oxidizes disintegrated metals, for example, iron, hydrogen, sulfide, natural synthetic substances (VOCs). Aeration is frequently the primary significant procedure at the treatment plant. Air circulation of fluids is accomplished by passing the fluid right through air by methods for wellsprings, falls, paddle-wheels or cones .going air through the fluid by methods for the Venturi tube, air circulation turbines or packed air which can be joined with diffuser(s) air stone(s), just as fine air pocket diffusers, coarse air pocket diffusers or direct air circulation tubing. Pottery is proper for this reason, regularly including the scattering of fine air or gas rises through the penetrable clay into a fluid. The littler the air pocket, the more gas is presented to the fluid expanding the gas move effectiveness. Diffusers or sparkers can likewise be proposed into the framework to cause disturbance or blending whenever wanted. Permeable earthenware diffusers are made by combining aluminum oxide grains utilizing porcelain bonds to shape a solid, consistently permeable and homogeneous structure. The coherently hydrophilic material is effectively wetted bringing about the creation of fine, uniform air pockets. On a given volume of air or fluid, the surface region changes relatively with a drop or air pocket measurement, the surface zone where trade can emerge. Using very little air pockets or drops expands the rate of the gas move (aeration) because of the higher contact surface territory. The pores which these air pockets go through are normally micrometer-size.

ii. Fenton Process

The Fenton procedure is an appealing option in contrast to the regular oxidation process in the gushing treatment of unmanageable mixes. The oxidation of characteristic substrates by Fe^{2+} and H_2O_2 is called Fenton and it was portrayed by H.J.H Fenton. In this study the fenton reagent is used to remove the organic pollutants& colour textile dyeing industry is the most one polluting industry in india it affects the human health and mass is the one environmental impacts,so fenton is used to reduce the pollutant.

It is prepared by the standard procedure. The fenton technique is a well known Advanced Oxidation Process (AOP) for treating dye wastewater. Be that as it may, high utilization of compound reagents and taking off creation of slop are common issues when utilizing this procedure and furthermore, textile wastewater has wide-extending attributes. Along these lines, powerfully directing the Fenton procedure is basic to diminishing the working expenses and improving the procedure execution.

Retrieval Number: A10281291S419/2019©BEIESP
DOI:10.35940/ijeat.A1028.1291S419
Journal Website: www.ijeat.org

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

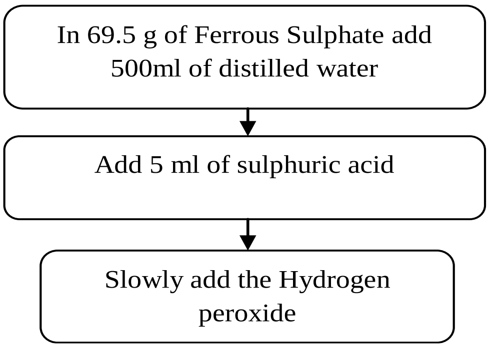

Fig.3. Fenton Preparation flow Chart

III. RESULTS AND DISCUSSION

Table-3: Advance Treatment Comparison Trail -1- (Aeration and 10ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
pH		4.53	5.01	6.5
BOD	mg/l	350	254	152
COD	mg/l	500	302	217
TDS	mg/l	354	194	179
TSS	mg/l	305	265	45
Turbidity	NTU	80	43	39
Electric conductivity	μs/m	300	30	40
Phosphate	mg/l	7	5.04	2.11

Table 4: Advance Treatment Comparison Trail -2- (Aeration and 9ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
pH		5.75	6.26	7.5
BOD	mg/l	360	152	130
COD	mg/l	514	316	215
TDS	mg/l	278	147	112
TSS	mg/l	310	132	123
Turbidity	NTU	45	42	41
Electric conductivity	μs/m	270	20	21
Phosphate	mg/l	6.9	5.2	3.1

Table-5: Advance Treatment Comparison Trail -3- (Aeration and 8ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
pH		4.62	2.26	3.5
BOD	mg/l	370	172	113
COD	mg/l	498	204	193
TDS	mg/l	278	148	102
TSS	mg/l	310	142	133
Turbidity	NTU	48	46	44
Electric conductivity	μs/m	240	26	19
Phosphate	mg/l	7.5	4.2	1.5

Table -6: Advance Treatment Comparison Trail -4- (Aeration and 7ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
pH		5.76	2.90	4.94
BOD	mg/l	380	215	123
COD	mg/l	520	313	202
TDS	mg/l	245	133	91
TSS	mg/l	369	217	39
Turbidity	NTU	58	47	41
Electric conductivity	μs/m	170	20	19
Phosphate	mg/l	8	5.4	1.2

Table-7: Advance Treatment Comparison Trail -5- (Aeration and 6ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
pH		4.01	2.2	4.6
BOD	mg/l	355	193	132
COD	mg/l	550	322	211
TDS	mg/l	423	316	229
TSS	mg/l	325	125	35
Turbidity	NTU	75	23	21
Electric conductivity	μs/m	147	12	11
Phosphate	mg/l	8.5	4.78	2

Table -8: Advance Treatment Comparison Trail -6- (Aeration and 5ml/l of Fenton)

Characters	Units	Effluent Value	Treated Effluent after Advance Treatment	
			Aeration	Fenton Oxidation
Ph		5.04	3.1	5.6
BOD	mg/l	390	212	196
COD	mg/l	600	365	281
TDS	mg/l	526	254	196
TSS	mg/l	75.8	164	96
Turbidity	NTU	65	36	25
Electric conductivity	μs/m	200	175	126
Phosphate	mg/l	8.3	5.2	3

Retrieval Number: A10281291S419/2019©BEIESP
DOI:10.35940/ijeat.A1028.1291S419
Journal Website: www.ijeat.org

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958 (Online), Volume-9 Issue-1S4, December 2019

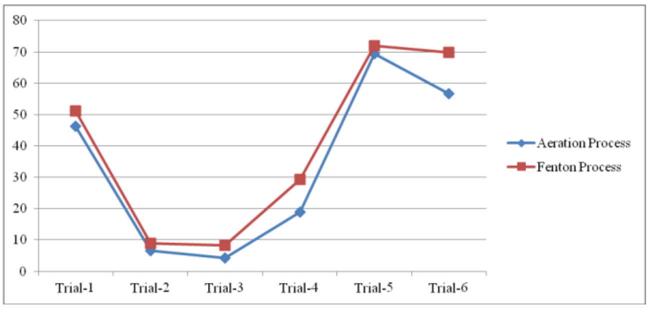

Fig.4: Percentage of Turbidity Removal-Comparison

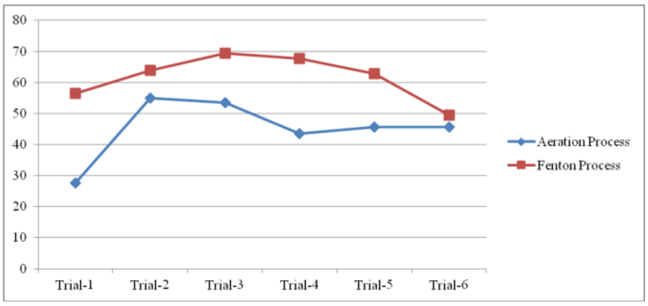

Fig.5: Percentage of BOD Removal-Comparison

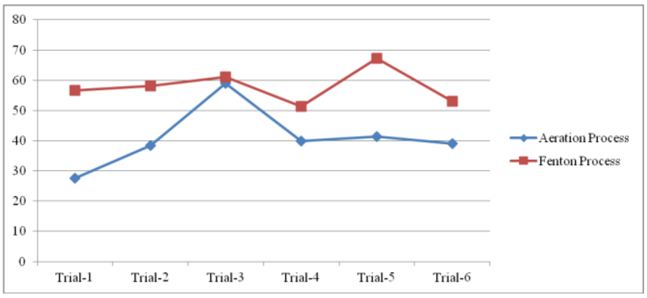

Fig.6: Percentage of COD Removal-Comparison

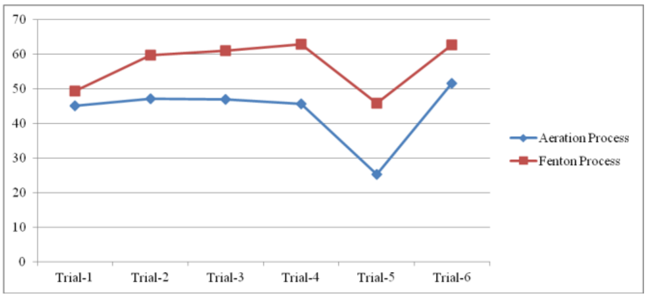

Fig.7: Percentage of TDS Removal-Comparison

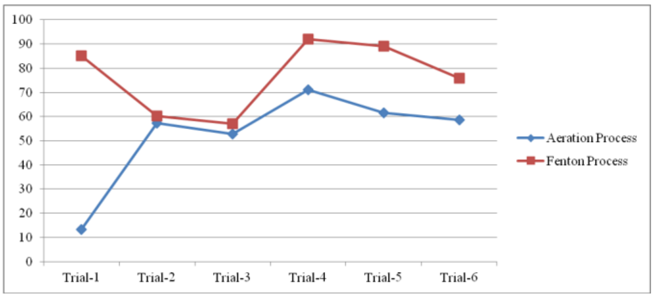

Fig.8: Percentage of TSS Removal-Comparison

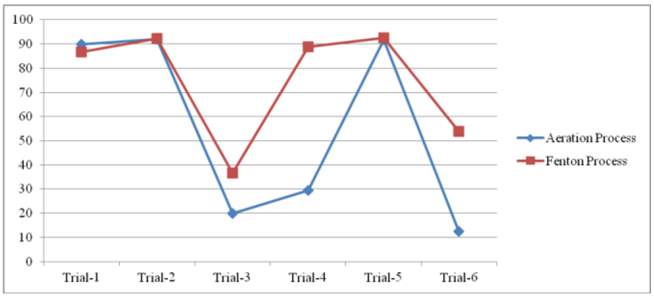

Fig.9: Percentage of EC Reduction-Comparison

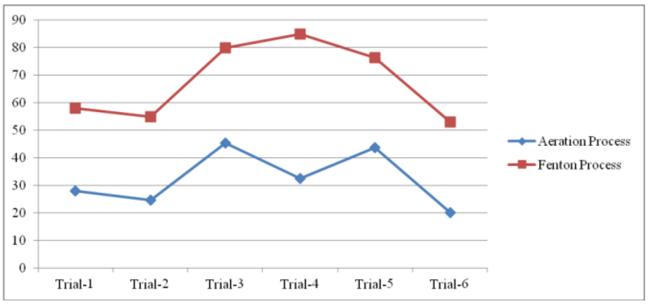

Fig.10: Percentage of Phosphate removal-Comparison

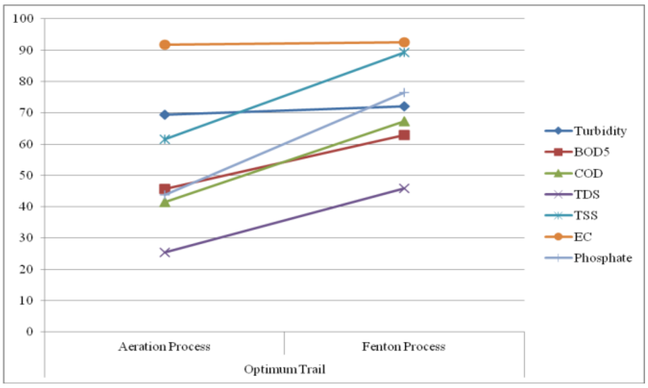

Fig.11: Percentage of Optimum Trail –Comparison

A. Comparison of Aeration and Fenton oxidation treatment

The following points have to be considered for a correct comparison, From Table 3 to 8, different variables (pH, BOD, COD, TDS, TSS, Turbidity, EC and Phosphate –Concentration) were studied to select the best conditions in the trials. Figure 1 to 8 is representing the percentage of organic/inorganic removal in the textile dye wastewater treatment trails. The results are summarized in Table 9.

For comparison, the best experimental conditions were selected. It can be observed that in the percentage of degraded COD & EC (Figure 6&9) because the contribution of the removal efficiency increased.

B. Cost Estimation

The comparison of the treatment costs is today one of the most important aspects. The overall costs are represented by the sum of the capital costs, the operating costs, and maintenance. For a full-scale system, these costs strongly depend on the nature and the concentration of the pollutants, the flow rate of the effluent and the configuration.

Retrieval Number: A10281291S419/2019©BEIESP
DOI:10.35940/ijeat.A1028.1291S419
Journal Website: www.ijeat.org

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

Table 9 is given the results of the percentage removal of organic/inorganic pollutants. From this trail experiments given the optimum results of treated effluents fig 11. In the aeration and Fenton reaction comparison, Fenton reagents gave more efficient removal.

IV.CONCLUSION

The final conclusions may be tired because of Comparison of various trails an Aeration and Fenton response which show that,

1. Fenton Reaction is better inorganic removal efficiency, Compare to aeration reaction
2. The optimum trail dose of 6ml/l H_2O_2 under these conditions 68% of COD removal was obtained, and also 92% of Total solids (EC) were removed.

REFERENCES

1. APHA, 1998,2005. “Standard Methods for Water and Wastewater Analysis”, 20th ed., American Public Health Association, Washington, D.C.
2. Adel Al-Kdasi and Katayon Saed, 2004. “Treatment of Textile Wastewater by Advanced Oxidation Process-A Review”,Global Nest: the International Journal Vol.6,No.3:PP 222-230.
3. Ali Akbar Babaei and Babak Kakavandi 2016. “Comparative treatment of textile wastewater by adsorption, Fenton, UV-Fenton and US-Fenton using magnetic nanoparticles-functionalized carbon”:Journal of industrial and Engineering Chemistry,- http://dx.doi.org/10.1016/j.jiec.2017.07.009
4. Chandrakant R.Holkar, Ananda J.Jadhav and Dipak V.Pinjari, 2016. “A Critical Review on textile wastewater treatments: Possible approaches”, Journal of Environmenta1 Management 182: PP 351-366.
5. Debabrata Mazumder, 2011. “Process evaluation and treatability study of wastewater in a textile dyeing industry”, International Journal of Energy and Environment, Vol.,7 Issue 6: PP 1053-1066.
6.Ebrahiem E.Ebrahiem, 2013.”Removal of organic pollutants from industrial wastewater by applying photo-Fenton oxidation technology”: Arabian Journal of Chemistry,2017- 10,PP S1674-S1679.
7. J.F.Perez,J.Llanos and C.Saez 2016. “Treatment of real effluents from the pharmaceutical industry: A comparison between Fenton oxidation and conductive-diamond electro-oxidation”, Journal of Environmental management , Science Direct article in press: PP 1-8.
8. J Paul, AA Kadam, SP Govindwar and P Kumar, 2013. “An insight into the influence of low dose irradiation pretreatment on the microbial decolouration and degradation of Reactive Red-120 dye”, Chemosphere 90:PP 1348-1358.
9. Kant.R, 2012. “Textile Dyeing industry an Environmental hazard”, Natural Science, 4:PP 22-26.
10.Mahmet Emin Argun and Mustafa Karatas 2010. “Treatment of Mineral –Oil Recovery Industry wastewater by sequential aeration and fenton’s oxidation process: Environmental Engineering and management”,Journal,Vol.9,,No.5:PP 643-649.
11.Mahmud. K, Hossain. M.D and Ahmed. S 2011. “Advanced landfill leachate treatment with least sludge production using modified Fenton process”: International Journal of Environmental Sciences Vol. 2, No 1: PP 271-282.
12.Naik.D, Desai H and Desai T.N,2013, “Characterization and Treatment of Untreated Wastewater generated from Dyes and Dye intermediates Manufacturing Indus-tries of Sachin Industrial Area, Gujarat”, India,Journal of Environmental Research and Development , Vol.7,No :4A, April-June: PP1602-1606.
13.P Bautista, A F Mohedano, J A Casas, J A Zazo and J J Rodriguez, 2008, “An overview of the application of Fenton oxidation to industrial wastewaters treatment”, Journal of Chemical Technology and Biotechnology, 83: PP 1323-1328.
14.Philippe C.Vandevivere, Roberto Bianchi and Willy Verstraete1 1998, “Treatment and Reuse of Wastewater from the Textile Wet-Processing Industry: Review of Emerging Technologies”, Journal of Chemical Technology 72:PP289-302.
15.Roberto Andreozzi and Vincenzo Caprio 1999. “Advanced oxidation processes (AOP) for water purification and recovery”, Catalysis Today 53: PP 51–59.
16.Santiago Esplugas, Jaime Gim!enez, Sandra Contreras, Esther Pascual and Miguel Rodrı´guez 2002, “Comparison of different advanced oxidation processes for phenol degradation”, Water Research 36 :PP 1034–1042.
17.S. A. Paul , K. Chavan and D. Khambe, 2012. “Studies On Characterization of Textile Industrial Waste Water In Solapur City”, Int. J. Chem. Sci. 10(2): PP 635-642.
18.S.Krishnan and Rawindran,2016. “Comparison of various advanced oxidation processes used in remediation of industrial wastewater laden with recalcitrant pollutants”, IOP Conf. Series: Materials Science and Engineering 206 (2017) 012089.
19.S.Rajesh and Premkumar R ,and Jeyadevi Neethipathi 2019, “Relative Effectiveness of Methane (Biogas) Production from Dry Grass Soaked with Vegetable Waste, Poultry Waste and Cow Dung, Oriental Journal of Chemistry”, Volume 35,Issue 2,April 2019,PP 732-737.
20.Sreeja P H and, Sosamony K J ,2016, “A Comparative Study of Homogeneous and Heterogeneous Photo-Fenton Process for Textile Wastewater Treatment”, International Conference on Emerging Trends in Engineering, Science and Technology, Procedia Technology 24 :PP 217 – 223.
21.S.Sowmiya Lakshmi,S.Rajesh and Premkumar R ,2018, “Removal of Organic Pollutants From Textile Dye Wastewater By Advanced Oxidation Process”, International Journal of Civil Engineering & Technology, (IJCIET),Volume 9,Issue 4,April 2018,:PP 452 – 461.
22.U. Rott and R. Minke, 1999, “Overview of Wastewater Treatment and Recycling in the Textile Processing Industry”, Pergamon Wal. Sci. Tech Vol. 40, No. I, PP 137-144.
23.Vinod Kumar Gupta and Imran Ali, 2012. “Chemical Treatment Technologies for Waste-Water recycling – an Overview”, Royal Society of Chemistry, 2: PP 6380-6388.
24.Wang Z Xue,Huang K and Liu Z ,2011. “Textile dyeing wastewater treatment In: Advances in Treating Textile Effluent, Intech”, PP 91-116.

AUTHORS PROFILE

Er.S.Rajesh Completed B.E(Civil) degree from GCE, Tirunelveli in 2009 and M.E(Environmental) degree from ACCET,Karakudi in 2013. He is working as Asst professor in KARE , Krishnankoil and Research scholar in KARE.His research area is Envionmental Engineerring..He is having 7 years Academic Experience and 10 years Industry consultancy Experience. He is Chartered Engineer & Valuer in India. He is Professional member of the IOV, IEI and PE. He has published more than 10 SCOPUS indexed Journal and Conference in and around India.

Er. R.Premkumar had completed B.E degree in Civil Engineering and M.E degree in Structural Engineering from Anna University, Chennai, Tamil Nadu in 2008 and 2012 respectively. He is currently working as Assistant Professor in the department of Civil Engineering at Kalasalingam Academy of Research and Education. He has 2 year of industrial experience and 7 years experience in academics and consultancy. His current research interests are Geopolymer Concrete and Earthquake resistance structures.

.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

Table- 9: Effluent Treated Percentage –Comparison

S.no	Character	Trial-1		Trial-2		Trial-3		Trial-4		Trial-5		Trial-6	
		Aeration Process	Fenton Process	Aeration Process	Fenton Process	Aeration Process	Fenton Process	Aeration Process	Fenton Process	Aeration Process	Fenton Process	Aeration Process	Fenton Process
1	**Turbidity**	46.2	51.2	6.67	8.89	4.17	8.34	18.9	29.3	69.3	72	56.6	69.8
2	**BOD_5**	27.5	56.5	55	63.8	53.5	69.4	43.4	67.6	45.6	62.8	45.6	49.4
3	**COD**	27.6	56.6	38.5	58.1	59	61.2	39.8	51.3	41.4	67.2	39.1	53.1
4	**TDS**	45.2	49.4	47.1	59.7	47	61	45.7	62	25.3	45.8	51.7	62.7
5	**TSS**	13.2	85.2	57.4	60.3	52.9	57.1	71.2	92.1	61.5	89.2	58.7	75.8
6	**EC**	90	86.6	92	92.2	20	36.6	29.4	88.8	91.8	92.5	12.5	53.8
7	**Phosphate**	28	58.1	24.6	55	45.3	80	32.5	85	43.7	76.4	20	53

Retrieval Number: A10281291S419/2019©BEIESP
DOI:10.35940/ijeat.A1028.1291S419
Journal Website: www.ijeat.org

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)