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Hospital wastewater treatment by electro-coagulation process

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ABSTRACT

The wastewater generated by the hospitals may contain pathogens, bacteria, viruses, pharmaceuticals etc. In this paper, the review has been done for the treatment of hospital wastewater containing harmful ingredients using electrocoagulation, the reuse of the same water after treatment.

Keywords— *Electrocoagulation, Hospital wastewater, Sewage treatment plant*

1. INTRODUCTION

Electrocoagulation method is one of the effective methods for the treatment of Industrial wastewater because of its low operation and maintenance cost, high efficiency, time-saving, lower sludge production without any addition of chemicals. The efficiency of electro-coagulation method mainly depends on the treatment time, the conductivity of the solution, the distance between electrodes and the current density. Hospital wastewater effluents discharge in environment may cause serious threat to the environment as well as humans and this effluents also contain solids, BOD, COD, phenols, radioactive isotopes, pathogens such as bacteria, viruses, blood, body fluid, sweat, contaminated organs, disinfectant, pharmaceuticals as well as hazardous chemicals, pathogenic microorganisms and other heavy metals and toxic chemical compounds such as Cu, Fe, Cd, Pb, Hg, Ni, Pt, Cyanide, Phenol and this type of wastewater can adversely affect ecology balance and public health. These contaminants can be effectively removed by Electro coagulation method.

2. RESULTS AND DISCUSSIONS

The stepwise procedure carried out for the electro coagulation process

1. Collection of a pretreated waste water sample from the hospital waste treatment plant.
2. Find out the various parameter of the waste which collected like BOD, COD, pH, SS, TDS and TS.
3. Take the 5-10 litre sample and feed in the Electro coagulation cell.
4. Apply current to the EC cell.
5. Taking the readings at 6V current with various times of intervals.
6. Similarly takes the various readings at 12V current supply at different times of intervals.
7. Compares the readings for both voltages and plot the graph time vs. various quality parameters.

After collecting the samples of wastewater and giving treatment from all the three methods, for every 30, 45,60,75,90,105,120 minutes interval and 6V DC current following are results obtained for all the parameters values.

Table 1: Pilot Plant reading 1

Sample No	Time Min.	Current (Voltage)	% COD Reduction	% SS Reduction	% TDS Removal
1	30	6	22	8	12
2	45	6	27	16	20
3	60	6	35	26	25
4	75	6	45	32	36
5	90	6	58	42	48
6	105	6	68	48	65
7	120	6	72	62	75

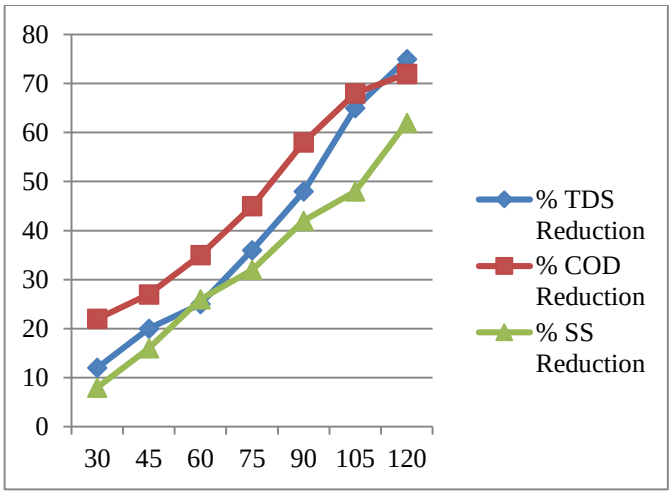

Fig. 1: Pilot Plant reading 1

After collecting the samples of wastewater and giving treatment from all the three methods for every 30, 45,60,75,90,105,120 minutes interval and 12V DC current following are results obtained for all the parameters values.

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Table 2: Pilot Plant reading 2

Sample No	Time Min.	Current (Voltage)	% COD Reduction	% SS Reduction	% TDS Removal
1	30	12	27	26	24
2	45	12	35	32	36
3	60	12	55	45	48
4	75	12	68	62	65
5	90	12	72	70	78
6	105	12	78	76	82
7	120	12	90	88	92

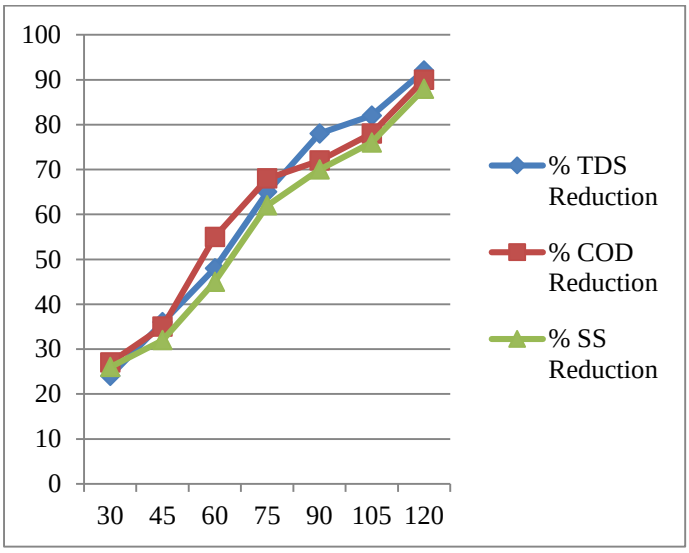

Fig. 2: Pilot Plant reading 2

3. CONCLUSION

- The Electro coagulation method for waste water treatment shows better results over the conventional method.
- Electro coagulation method can be used as a tertiary treatment to waste water.
- The other parameters such as TDS, COD, BOD shows an effective reduction over conventional methods.
- Wastewater samples are collected from the industry after giving primary and secondary treatment and EC with any conventional method gives better results.
- Electro-coagulation is not using any chemical addition for treatment of wastewater hence it can directly release into the environment.
- According to the analysis results, the EC treatment is better for the treatment process of hospital waste.

4. REFERENCES

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