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Electro-coagulation process used to treat hospital wastewater

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ABSTRACT

The wastewater generated by the hospitals contains pathogens, bacteria, viruses, pharmaceuticals and other hazardous contaminants. Traditional treatment methods become insufficient to remove these contaminants. In this paper, the review has been done for the treatment of hospital wastewater using electrocoagulation.

Keywords— *Hospital wastewater, Electro-coagulation, Sewage treatment plant*

1. INTRODUCTION

Electrocoagulation method is an effective method 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. Hospital wastewater effluents discharge in the environment may cause a serious threat to the discharging body as well as humans. This effluent contains 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. These contaminants can be effectively removed by Electro-coagulation method.

2. RESULTS AND DISCUSSIONS

The stepwise procedure carried out for the electrocoagulation process

1. A pretreated wastewater sample from sewage treatment plant was collected.
2. The sample was analysed for BOD, COD, pH, SS, TDS and TS in a laboratory recognized by Ministry of Environment & Forest.
3. A 10 Litre sample was collected and fed in a pilot scale electro-coagulation (EC) cell.
4. The current was applied to the EC cell.
5. Reading at 6V current at various time intervals (from 30 min to 120 min) were taken. – Pilot Plant reading 1
6. The resultant partially treated effluent after each time interval was drawn for analysis.
7. Now above set of the time interval, the current was increased to 12 V and passed through EC cell for a various time interval (30 min to 120 min) – Pilot Plant reading 2.
8. Both the results are compared against a decrease in pollution parameters.

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

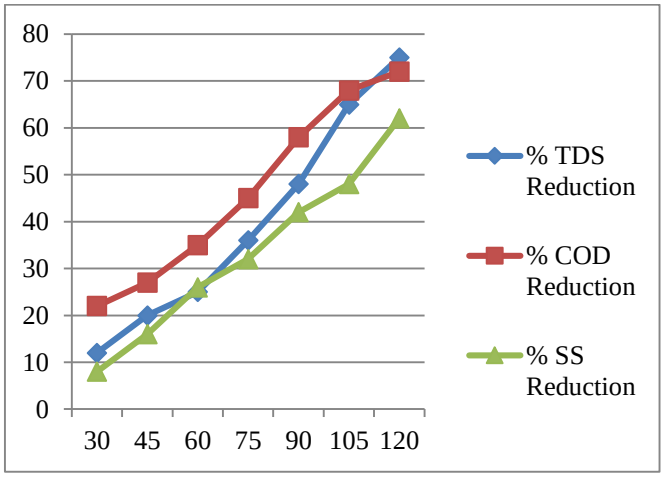

Fig. 1: Pilot plant reading 1

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

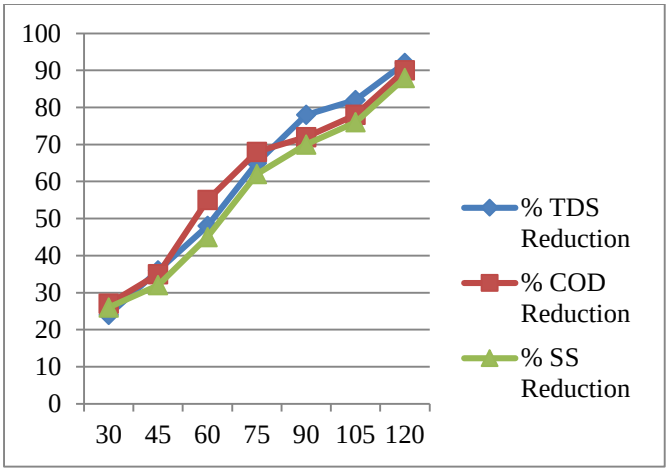

Fig. 2: Pilot plant reading 2

3. CONCLUSION

- As Electro coagulation method gives better results than the conventional methods it can be used as a tertiary treatment to wastewater.
- The parameters viz. TDS, COD, BOD shows an effective reduction over conventional methods.
- Electro-coagulation is not using any chemical addition for treatment of wastewater hence it can directly release into the environment.

4. REFERENCES

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