**Treatment of sugar industry effluent using electrocoagulation process: Process optimization using response surface methodology**

SHREYAS GONDUDEY1, PARMESH KUMAR CHAUDHARI2\*, SANDEEP DHARMADHIKARI3 and RAGHWENDRA SINGH THAKUR4

*1,2\*Department of Chemical Engineering, National Institute of Technology, Raipur (C.G.), 492010,India,*

*3,4Department of Chemical Engineering, SOS, Engg. and Tech., Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.), 495009, India*

*\*Corresponding author. E-mail:* *pkchaudhari.che@nitrr.ac.in*

Table S-1. Parameters of sugar industry wastewater

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.No. | Parameter\* | Sahu et al., 20158 | Kolhe et al., 20093 | Present study |
| 1 | pH | 5.5 | 6.5-8.8 | 4.85 |
| 2 | *BOD* | - | 300-2500 | - |
| 3 | *COD* | 3682 | 1500-2800 | 3200 |
| 4 | *DO* | - | 0-2.0 | - |
| 5 | *TS* | 1987 | 870-2000 | 2240 |
| 6 | *TDS* | 1447 | 400-1650 | 1436 |
| 7 | *SS* | 540 | 220-800 | 804 |
| 8 | Cl | 50 | 18-40 | 225 |
| 9 | S | - | 40-70 | 37.5 |
| 10 | Oil & Grease | - | 60-100 | - |
| 11 | Color | Dark brown | Dark yellow |  |
| 12 | Phosphate | 5.9 | - | 0.73 |
| 13 | Hardness | 900 | - | 720 |
| 14 | Protein | 43 | - | - |

\*All values in mg dm-3,except for pH.

Table S-2. Reactor and electrode specification.

|  |  |
| --- | --- |
| **Reactor**  | **Specification** |
| Make | Perspex glass |
| Volume (dm3) | 1.72 |
| Electrode gap (mm) | 25 |
| No. of electrode | 4 |
| Mode of operation | batch |
| Stirring mechanism (length × diameter, mm) | Magnetic bar(25 × 5) |
| Mixing/reaction time (min) | 50-100 |
| **Electrodes** |
| Material (Anode and Cathode) | Iron (MS) |
| Shape | Rectangular |
| Size of each plate (mm) | 85 x 120 |
| Thickness (mm) | 2 |
| Effective size (*L* x *H*, mm) | 85 x 80 |
| Plate arrangement | Parallel |

|  |  |
| --- | --- |
| **(a)** | **(b)** |
| **(c)** | **(d)** |
| **(e)** | **(f)** |
| Fig. S-3 Three dimensional response surface graphs for *COD* removal (%) in EC treatment of SIE |