

SIIC085

ELECTROCHEMICAL PROPERTIES OF ELECTRIC ARC FURNACE SLAG FOR DEGRADATION OF ACID ORANGE II

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Abstract:

Electrochemical properties of Electric Arc Furnace Slag (EAFS) derived from metal steel waste as potential electrode for degradation of Acid Orange II (model pollutant). The objectives of this research are to study the oxidation and reduction process of EAFS through electro-Fenton reaction process using cyclic voltammetry (CV) and to analyze the potential of EAFS for degradation of Acid Orange II (AO2) through cyclic voltammetry profile. This research project is conducted to analyze two types of electrode which were IO electrode and EAFS electrode using CV. The scan rate for each sample varies (10, 20, 30, 40, 50, and 60 mV/s). From results obtained, effect of various scan rate on IO and EAFS electrode is observed for the CV pattern. EAFS electrode shows great rate capability along with efficient pseudocapacitive performance. The occurrence of oxidation and slight reduction in EAFS electrode proves the potential of the electrode based on the CV pattern.

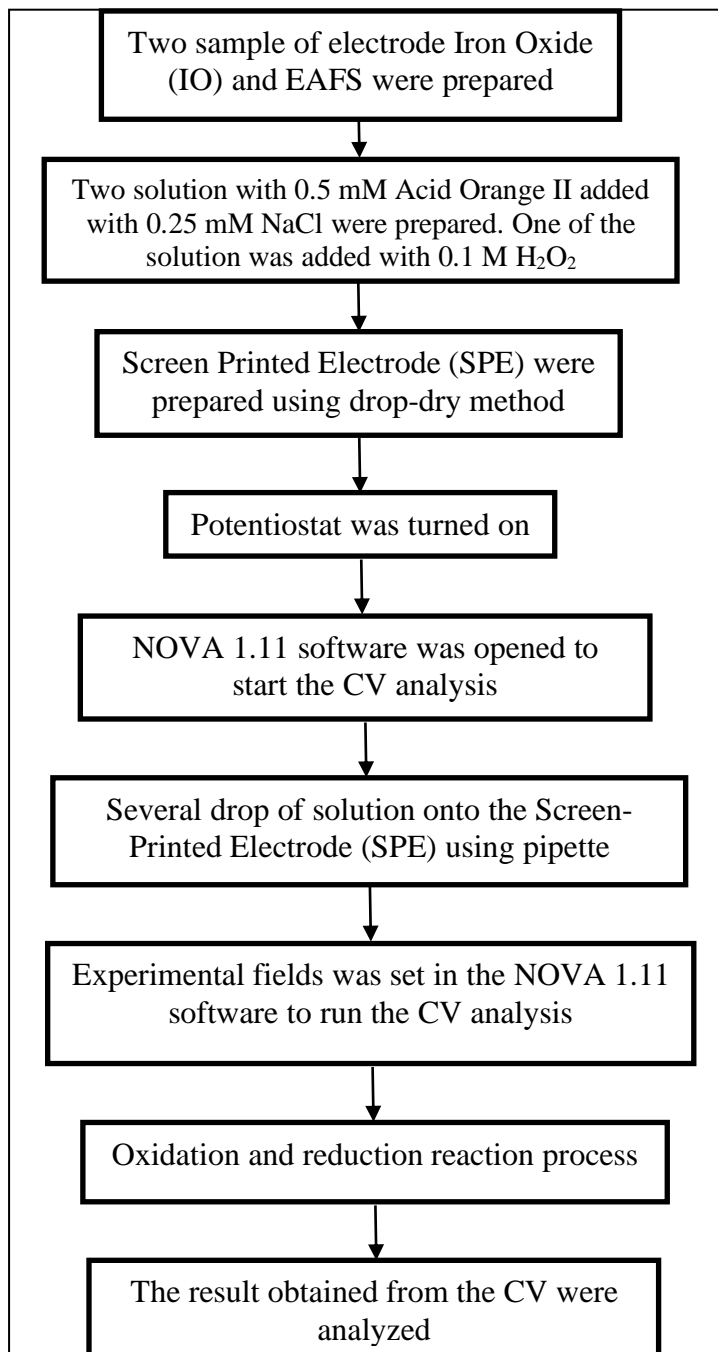
Keywords:

Electric Arc Furnace Slag (EAFS), Electrode, Acid Orange II (AO2), Cyclic Voltammetry (CV), Dye Pollutants

Objectives:

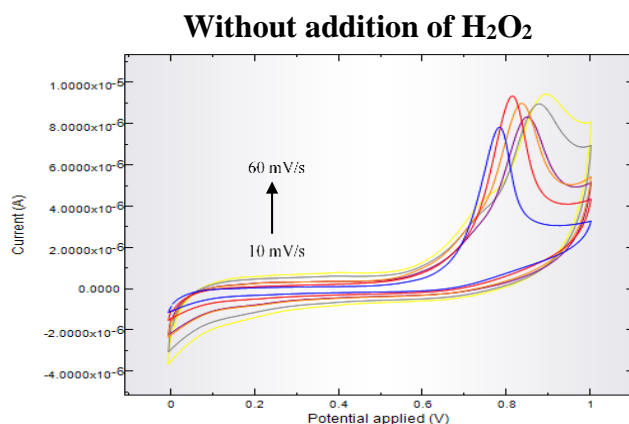
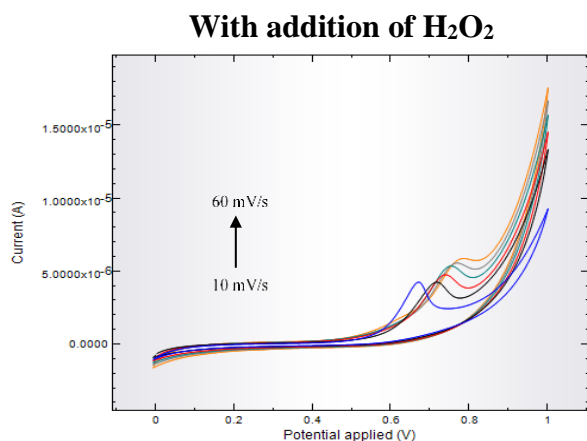
- To study the oxidation and reduction process of EAFS through Electro-Fenton reaction process using Cyclic Voltammetry.
- To analyze the potential of EAFS for degradation of Acid Orange II through Cyclic Voltammetry profile.

Methodology:

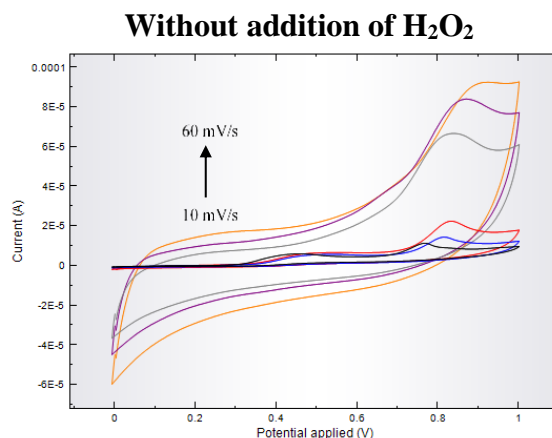
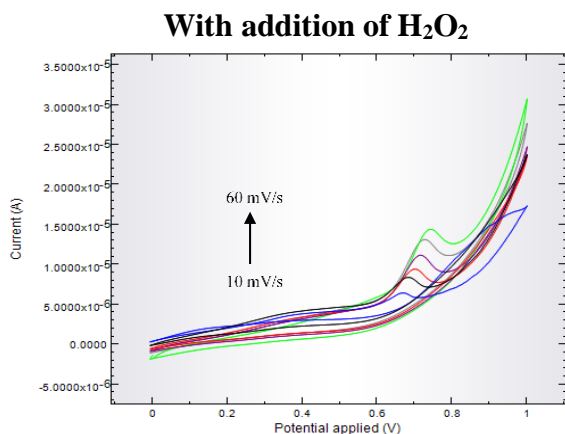


Results:

1) Iron Oxide (IO) CV Analysis



2) Electric Arc Furnace Slag (EAFS) CV Analysis



Conclusion:

EAFS demonstrated a potential electrode for initiative to replace IO electrode and platinum electrode as well as efficiency for Electro-Fenton reaction process for AO₂ (model pollutants) removal. From the finding in which EAFS electrode show that the electrode is stable. Besides that, effect of various scan rate on EAFS electrode it show that, the peak currents increase was observed with increasing scan rate. This show a great rate capability along with better pseudocapacitive performance of the electrode material. This can be conclude that EAFS electrode is more efficient in removal of AO₂ dye compare to the IO electrode and with the occurrence of redox potential in EAFS electrode prove the potential of the electrode.