J Anal Bioanal Techniques 2012, 3:7
http://dx.doi.org/10.4172/2155-9872.S1.010

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Analytical & Bioanalytical Techniques

November 22-24, 2012 Hyderabad International Convention Centre, India

Bio-analysis of microbial electrodes in BES

Pratiksha Jain
TERI University, India

A Bioelectrochemical system consists of an anode and a cathode dipped in an electrolyte solution where microbes act as catalyst. Oxidation of substrate occurs on the anode side of the BES. This leads to generation of electrons that get transferred to the cathode compartment of the BES via an external circuit. To counter balance these electrons an equal number of protons are generated in the anode compartment, which get transported to the cathode compartment via the membrane. These electrons and protons combine together to form water and also facilitate other reductions in the process. The study was conducted using an H type cell, where activated carbon fabric was used as an electrode material and the two chambers were separated using a cation exchange membrane. Cyclic Voltammetry (CV) and Differential pulse voltammetry (DPV) are important and widely used electro analytical techniques for BES analysis. CV is based on varying the applied potential at a working electrode in both forward and reverse directions while monitoring the current. DPV uses a series of potential pulses of fixed amplitude, which is superimposed in a slowly changing base potential. In this study, DPV was used for a novel application of estimating the biofilm growth over a period of time in a BES. The optimum range for measuring CV was determined to be -0.6V to 0.6V, while for DPV it ranged from -0.4V to 0.2V. The planktonic sample was also studied using Ziess microscope and the biofilm developed on the electrode material was studied using scanning electron microscopy. Hence these techniques are useful for assessing the overall dynamics of a BES.

Biography

Pratiksha Jain is currently working as a Research Associate (trainee) at TERI. She is working on a project entitled "Prevention of paraffin deposition in oil well tubings and microbial enhanced oil recovery (MEOR) through biotechnological interventions".

pratiksha891@gmail.com

Separation and detection of aliphatic and aromatic fractions of crude oil

Pratiksha Jain
TERI University, India

Column chromatography is commonly used as a purification technique for isolating desired compounds from a mixture. In the present study, silica gel was used to separate the components (aliphatic and aromatic) of crude oil samples based on the difference in their polarities. A column was filled with activated silica gel of mesh size 60-120. After flushing the column with n-hexane for three to four times, crude oil (adsorbed on silica gel) was loaded onto the column. Column was eluted successively with hexane and dichloromethane of different ratios and finally with dichloromethane, collecting fraction of 10ml each. The solvent was removed under vacuum and analyzed by Gas chromatography fitted with flame ionization detector (FID). The column used was HP-5 (30m X 320µm id X 0.5µm film thickness) with carrier gas as Helium (3 ml/min). The temperatures of the injector and detector were 300°C. The temperature was programmed 55°C for 1min to 290°C @ 5°C/min. By using the above method, the limit of detection of polyaromatic hydrocarbons was found to be 50ppm and 10ppm for aliphatic hydrocarbons. The method was found to be sensitive and reproducible over a large umber of concentrations.

Biography

Pratiksha Jain is currently working as a Research Associate (trainee) at TERI. She is working on a project entitled "Prevention of paraffin deposition in oil well tubings and microbial enhanced oil recovery (MEOR) through biotechnological interventions".

pratiksha891@gmail.com