



## High Energy Generation in a Microbial Fuel Cell

C.-Y. Chen, V.R. Nimje, and A.S. Reddy

National Chung Cheng, Earth and Environmental Sciences, Chiayi, Taiwan (yen@eq.ccu.edu.tw)

The gram-positive, aerobic bacteria *Bacillus subtilis* for the first time has been employed in a microbial fuel cell (MFC). A MFC has been operated for over 3 months to establish the highly active MFC using M9 minimal medium as the catholyte, carbon cloth as an anode and 20% platinum electrode as cathode. The bioelectrical responses of microbial fuel cell are characterized with an open-circuit potential measured at an average value of 470 mV. In-situ cyclic voltammograms with biofilm and without biofilm anodes were performed in the growth phase showed that the redox metabolite were produced and varied in the physiological status. Voltammograms obtained from the comparative study of broth, supernatant and resuspended bacterial cells revealed that the electrochemical activity in the anode chamber was due to the redox compounds in supernatant. The results elucidate that the microorganism *B. subtilis* is electrochemically active and the electron transfer mechanism was mainly due to the excreted redox compounds (mediator) in the broth solution and not because of the membrane-bound proteins.