

Production of highly selective glyceraldehyde from electrocatalytic glycerol oxidation

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Electrochemical system such as fuel cell is essentially an energy converter, but it may be also considered as an electrochemical converter in biorefineries depending on the operating mode. The electrocatalytic processes that generate chemicals are very similar to those involved in conventional heterogeneous catalysis. However, a distinguishing feature of electrochemical processes compared to catalytic processes is the ability to manipulate the size of the activation barrier by varying the electrode potential, which is responsible for the high selectivity of electrochemical processes. In this study, we report a novel conversion technology to produce highly selective glyceraldehyde from electrocatalytic oxidation of biomass-derived glycerol. The highly selective glyceraldehyde production (>90% selectivity) can be obtained using a modified half cell system. Depending on the various reaction conditions, the electrocatalytic performance in obtaining the glyceraldehyde product will be explored and discussed by its conversion, selectivity and production rates with respect to the products obtained, and/or its current efficiency in this work.