

Upgrading bio-derived caproic acid using electrocatalytic decarboxylation and dimerization

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Electrocatalytic conversion of bio-derived chemicals represents a promising technique for the production of value-added chemicals and fuels. Here, we used bio-derived caproic acid (CA) for electrochemical decarboxylation and dimerization to convert CA into value-added and carbon-elongated biochemicals. Throughout Kolbe reaction using Pt wire as electrodes, caproic acid was converted into other chemicals over 99% within 12 hrs and more than 80% faradaic efficiency was achieved. Accordingly, various reaction parameters such as electrolytes, electrode materials, applied voltages, etc. were examined to investigate the product selectivity by the Kolbe reaction. Product diversity depending on reaction parameters was also evaluated using principal component analysis (PCA).