Electrosynthesis of Cyclic Carbonates from CO₂ and Epoxides on Compacted Silver Nanoparticles Electrode

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Electrosynthesis of cyclic carbonates from carbon dioxide with epoxides has been carried out at room temperature and normal pressure in a one-compartment electrochemical cell using silver nanoparticles electrode as cathode, avoiding any additional catalysts. To optimize the reaction conditions, the effects of current densities, substrate concentration, charge amount and temperature have been investigated. Moreover, the generality of silver nanoparticles electrode for electrosynthesis of cyclic carbonates has been studied. From the results, all epoxides studied in this work could be converted into the corresponding cyclic carbonates with moderate to good yields (30%-70%). In addition, this electrode is stable and reusable which could be reused multiple times without activity loss.

Keywords: Carbon dioxide; Electrosynthesis; Cyclic carbonates; Silver nanoparticles

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