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Mechanism of the Carboxylation of Cyclohexanone with Carbon Dioxide Catalyzed by 1,8-Diazabicyclo[5.4.0]undec-7-ene*

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The dependence of the rate of carboxylation upon the concentration of the reactant was investigated in dimethyl sulfoxide. The reaction rate depends upon the concentration of cyclohexanone and 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU) in the first order, respectively. The reaction follows almost the first order dependence upon the CO₂ pressure in the range of 50—400 torr. From these characteristics of the reaction, it was suggested that the carboxylation proceeds *via* the reaction between CO₂ dissolved in dimethyl sulfoxide and the anion of cyclohexanone rather than that between the CO₂ adduct with DBU and cyclohexanone. The results of carboxylation by CO₂ adduct with DBU and by CO₂ dissolved in dimethyl sulfoxide also support the above conclusion. The formation of cyclohexanone anion by reaction of cyclohexanone with DBU was verified by the UV spectrum of the solution of concentrated DBU and cyclohexanone.

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