

Epoxidation of 1,3-Butadiene to Butadiene Monoxide Catalyzed by Iron Complexes with Diethyl Ether as Co-Solvent

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Butadiene monoxide is widely used to prepare vinyl ethylene carbonate as an additive to improve the performance of Li-ion secondary battery. Synthesis of butadiene monoxide through epoxidation of 1,3-butadiene has been learned with using iron complex $[(\text{phen})_2(\text{H}_2\text{O})\text{Fe}(\text{III})_2(\text{-O})](\text{ClO}_4)_4$ as catalyst and commercial peracid acid as an oxidant in acetonitrile medium. The effects of reaction temperature from -10°C to -40°C and reaction time from 5 min to 90 min, and so the effect of diethyl ether as co-solvent in a reaction to the butadiene monoxide yield has been investigated. Butadiene monoxide yield is calculated by using gas chromatography (GC) with decane as an internal standard. Epoxidation reaction is completed very fast within 5 min for temperature -10°C and -15°C with diethyl ether as co-solvent. The highest yield of butadiene monoxide is 91% at -40°C , 120 min and 96% with diethyl ether as co-solvent in a reaction at -40°C , 90 min.

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