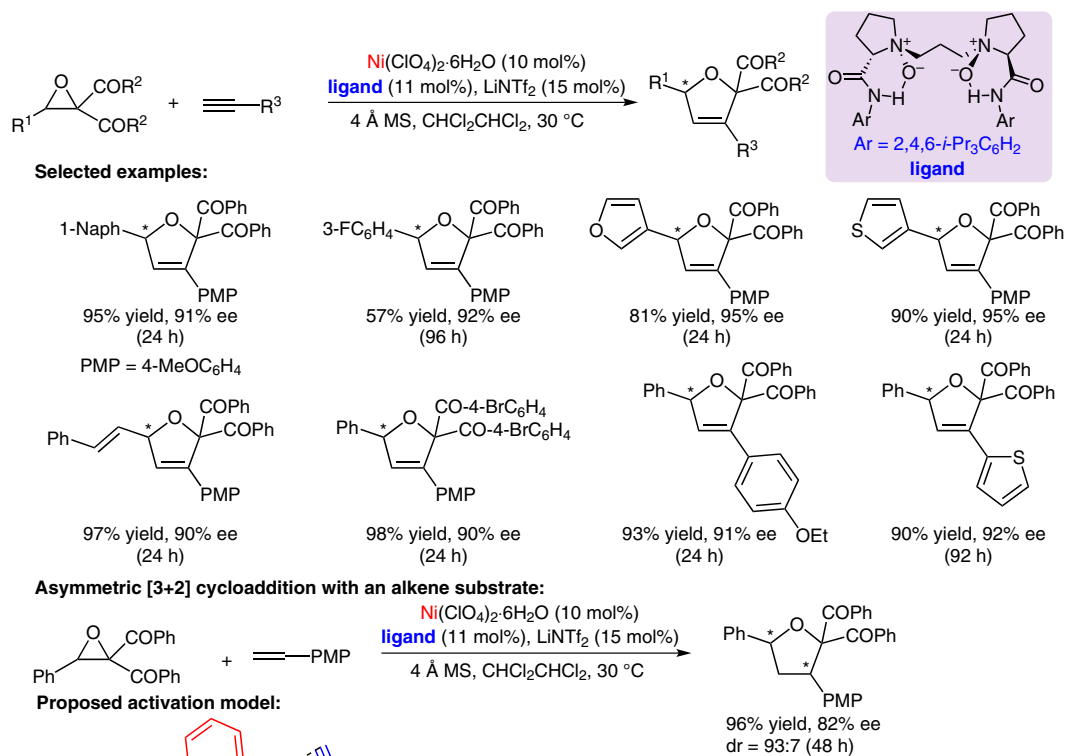


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An Asymmetric [3+2] Cycloaddition of Alkynes with Oxiranes by Selective C–C Bond Cleavage of Epoxides: Highly Efficient Synthesis of Chiral Furan Derivatives
Chem. Commun. **2014**, *50*, 11480–11483.

Chiral Furans via Asymmetric [3+2] Cycloaddition



Significance: Tetrahydrofurans and 2,5-dihydrofurans containing a stereocenter are often found in natural products and medicinal compounds. Ni(ClO₄)₂·6H₂O in the presence of an *N,N'*-dioxide ligand promotes the asymmetric [3+2] cycloaddition of alkynes with epoxides via a regioselective C–C bond cleavage to give 2,5-dihydrofurans. A catalytic amount of LiNTf₂ was necessary to increase the yield of the cycloaddition process.

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Comment: Notably, the asymmetric [3+2] cycloaddition of an alkene and an epoxide under optimized conditions afforded an optically active tetrahydrofuran derivative. According to the proposed activation model, the chiral nickel complex activates the epoxide to form a carbonyl ylide intermediate, through which the alkyne attacks from the *re* face, leading to the *R*-configured product.