Dinuclear Ruthenium(I) Triazenide Complexes as Catalysts for Carbenoid Cyclopropanation Reactions

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The ability of ruthenium(I) triazenide complexes \([\text{Ru(CO)}_3(\text{ArNNNAr})]_2\) (Ar = \(\text{C}_6\text{H}_4-4-X, X = \text{CH}_3, \text{Cl}, \text{Br}\)) to catalyze the cyclopropanation of alkenes with methyl diazoacetate is investigated. With terminal alkenes (styrene, ethyl vinyl ether, 1-hexene), the cyclopropanecarboxylic esters are formed in good to high yield and with an \(E:Z\) diastereoisomer ratio of about 1.0 in most cases. 2-Methyl-2-butene is cyclopropanated in low yield but with a syn-selectivity up to 90:10.

Key words: Catalysis, Cyclopropanation, Diazo Compounds, Ruthenium Complexes, Triazenide Ligands