

## 烯烃环丙烷化反应催化研究

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摘要 本文研究了用Cu(CH<sub>3</sub>CCHCCH<sub>3</sub>)<sub>2</sub>, Ph<sub>3</sub>PCuX, Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub>

等催化剂催化四甲基乙烯和重氮乙酸乙酯的环丙烷化反应。结果表明配体吸电子能力越强,立体位阻越小,

其催化活性也越强。考察了反应物与Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub>的配比,反应温度对Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub>

催化反应活性的影响。通过对Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub>催化活性中心的研究表明,催化活性中心是一价铜配合物,

并推断四甲基乙烯环丙烷化机理是经由金属卡宾机理。

关键词 [反应机理](#) [烯烃](#) [催化活性](#) [环丙烷化](#) [重氮乙酸乙酯](#) [四甲基乙烯](#)

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## Study on catalysis of cyclopropanation of olefins

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**Abstract** Cu(acac)<sub>2</sub>, Ph<sub>3</sub>PCuX, Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub> etc copper complexes were used to catalyze the reaction of cyclopropanation of tetramethylethene with ethyldiazoacetate. The stronger the ligand electroaffinity and the lower the steric hindrance of the ligands, the stronger the catalytic activity of their copper complexes. The activity of Cu(O<sub>2</sub>CCF<sub>3</sub>)<sub>2</sub> and the temperature of the reaction were studied. The active center of the catalysts was carefully researched and it was proved to be a one-valence copper complex. Induction period is because of the time necessary of the copper (II) to be reduced into copper (I) which is active species for EDA. The mechanism of this reaction was thought by means of metal carbene (A cycle).

**Key words** [REACTION MECHANISM](#) [ALKENE](#) [CATALYTIC ACTIVITY](#) [TETRAMETHYL-ETHYLENE](#)

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