

研究论文

对氯甲苯选择性氧化新催化体系研究

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摘要 报道了以乙酰丙酮配合物为催化剂, 氧气为氧源, 在乙醛存在下对氯甲苯的液相选择性氧化, 研究了不同中心金属离子、催化剂用量、乙醛用量、氧气压力、反应时间及反应介质对反应的影响. 结果表明, 在金属配合物中三(乙酰丙酮)合钴(III)的催化性能最好, 在其用量为0.764 mmol、乙醛用量为反应物物质的量的10%、氧气压力为2 MPa时, 以乙腈为反应介质, 室温下反应11 h, 反应的转化率和选择性可达15.3%, 87.16%, 对氯苯甲醛收率可达13.34%. 反应也可在无溶剂时进行, 此时反应的转化率、选择性及醛的收率分别为8.14%, 89.08%, 7.25%.

关键词 [对氯甲苯](#) [对氯苯甲醛](#) [选择性氧化](#) [仿生催化](#)

分类号

Study on a Novel Catalysis System for the Selective Oxidation of *p*-Chlorotoluene

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Abstract Catalysis of acetoacetonate complexes for the selective oxidation of *p*-chlorotoluene with oxygen in the presence of ethanal was first reported. The effects of the center metal ions, the amount of catalyst and ethanal, the oxygen pressure, the reaction time, and the reaction solvents on the selective oxidation were investigated. The results showed that among the acetoacetonate complexes, Co(acac)₃ had the best catalytic activity. The optimum reaction conditions were as follows: 0.764 mmol of Co(acac)₃, molar fraction of ethanal 10% based on the substrate, room temperature, oxygen pressure 2 MPa, reaction time 11 h and acetonitrile as solvent. Under these conditions, 13.34% *p*-chlorobenzaldehyde was obtained with 15.3% conversion and 87.16% selectivity. The oxidation can also be carried out without solvent with 8.14% conversion, 89.08% selectivity and 7.25% yield respectively.

Key words [p-chlorotoluene](#) [p-chlorobenzaldehyde](#) [selective oxidation](#) [biomimetic catalysis](#)

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