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## N-乙烯基甲酰胺的研究发展

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## 摘 要

N-乙烯基甲酰胺 (NVF) 是乙烯酰胺最简单的单体, 具有独特的物理化学性质, 它的应用也是十分广泛, 可作为聚合单体、溶剂。N-( $\alpha$ -羟乙基)甲酰胺是制备 N-乙烯基甲酰胺的中间体, 甲酰胺和干燥乙醇生成 N-( $\alpha$ -羟乙基)甲酰胺。

本文首先在碱性催化剂  $K_2CO_3$  的条件下, 用提纯后的乙醛和甲酰胺反应生成了中间体 N-( $\alpha$ -羟乙基)甲酰胺, 加入硫酸调节 pH 值后加入甲醇来进行醚化, 生成 N-(1-甲氧基乙基)甲酰胺, 在非酸性催化剂碳酸钙的作用下, 高温裂解生成 N-乙烯基甲酰胺, 通过改变反应物用量、催化剂种类、催化剂用量、反应温度、反应时间, 讨论了对 N-( $\alpha$ -羟乙基)甲酰胺产率的影响, 实验测得最佳反应条件是甲酰胺与乙醛的摩尔比为 1: 1.2, 催化剂  $K_2CO_3$  的量为甲酰胺摩尔量的 0.6%, 反应温度 45 $^{\circ}C$ , 反应时间为 70min, 产率大约为 60%。

**关键词:** N-乙烯基甲酰胺; N-( $\alpha$ -羟乙基)甲酰胺; 甲酰胺

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## Abstract

N-vinyl formamide (NVF) is the simplest monomer of vinyl amide. It has unique physical and chemical properties, and its application is also very extensive. It can be used as a polymerization monomer and solvent. N- ( $\alpha$ -hydroxyethyl) formamide is an intermediate for the preparation of N-vinyl formamide. Formamide and dried ethanol produce N- ( $\alpha$ -hydroxyethyl) formamide.

In this paper, under the condition of basic catalyst  $K_2CO_3$ , the intermediate N- ( $\alpha$ -hydroxyethyl) formamide is generated by the reaction of purified acetaldehyde and formamide. After adding sulfuric acid to adjust the pH value, methanol is added for etherification. Generate N- (1-methoxyethyl) formamide, under the action of non-acidic catalyst calcium carbonate, pyrolysis at high temperature to generate N-vinyl formamide, by changing the amount of reactant, catalyst type, catalyst amount, reaction temperature, The reaction time discussed the effect on the yield of N- ( $\alpha$ -hydroxyethyl) formamide. The optimal reaction condition measured by the experiment is that the molar ratio of formamide to acetaldehyde is 1: 1.2, and the amount of catalyst  $K_2CO_3$  is formamide The molar amount is 0.6%, the reaction temperature is 45 ° C, the reaction time is 70 min, and the yield is about 60%.

**Key words:** N-vinyl formamide; N- ( $\alpha$ -hydroxyethyl) formamide; Formamid

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