

# 年产 100 吨(S)-4-苄基-2-噁唑烷酮的生产工艺设计

**摘要：**手性噁唑烷酮是一种具有手性中心的五元杂环，其已被广泛应用到多种不对称有机合成反应中，如羟醛缩合反应、烷基化反应、狄尔斯-阿尔德反应（又称双烯加成反应）等。关于手性噁唑烷酮的制备，已报道的方法多以方便易得的天然氨基酸为原料。因此，本设计以此为基础，对年产 100 吨(S)-4-苄基-2-噁唑烷酮的生产工艺进行了设计，并根据工艺流程的相关数据进行物料衡算、能量衡算和相应的生产设备选型。此外，本设计使用 *AutoCAD* 软件绘制了工艺流程框图、物料衡算框图、带控制点的工艺流程图、车间平面布置图，并根据车间布置规范对(S)-4-苄基-2-噁唑烷酮生产车间进行最合理的布置，最终确定生产车间为两层。

**关键词：**生产工艺设计；(S)-4-苄基-2-噁唑烷酮；工艺流程；还原反应；环合反应

# Process Design of (*S*)-4-Benzyl-2-oxazolidinone Outputting 100 t/y

**Abstract:** Chiral oxazolidinone is a five-membered heterocycle with a chiral center, which has been widely used in many asymmetric organic synthesis reactions, such as aldol condensation, alkylation, Diels-Alder reaction (also known as diene addition reaction), *etc.* Based on the reported methods, the preparation of chiral oxazolidinone are mainly derived from natural amino acids which are easy to be obtained. Therefore, the production process of 100 tons (*S*)-4-benzyl-2-oxazolidinone per year is designed in this paper, and the material balance, energy balance and corresponding production equipment selection are carried out according to the relevant data of the process flow. In addition, AutoCAD software was used in the design to draw the process flow diagram, material balance diagram, process flow diagram with control points, workshop layout. According to the workshop layout specification, the most reasonable layout of (*S*)-4-benzyl-2-oxazolidinone production workshop is determined as two floors.

**Key words:** Production process design; (*S*)-4-Benzyl-2-oxazolidone; Process flow; Reduction reaction; Cyclization reaction

# 目 录

第 一 章 文 献 综 述.....	1
1.1 (S)-4-苄基-2-噁唑烷酮概念及发展概况.....	1
1.1.1 概念.....	1
1.1.2 发展概况.....	2
1.1.3 手性 4-取代-2-噁唑烷酮的应用研究.....	2
1.2 手性噁唑烷酮的国内外研究现状.....	4
1.2.1 光气环合法.....	4
1.2.2 尿素环合法.....	4
1.2.3 碳酸酯环合法.....	5
1.2.4 铑-磷配合物催化合成手性 4-取代-2-噁唑烷酮.....	5
1.3 本设计的设计内容及设计条件.....	6
1.3.1 主要研究内容.....	6
1.3.2 拟采取的研究方法、实施方案.....	6
第二章 工艺说明.....	7
2.1 工艺过程.....	7
2.1.1 还原过程.....	7
2.1.2 环合过程.....	7
2.2 工艺流程框图.....	7
第三章 物料衡算.....	8
3.1 计算依据.....	8
3 . 1 . 1 基 础 资 料 .....	8

---

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要  
下载或阅读全文，请访问：

<https://d.book118.com/158132132070006130>