

化学

低温精馏氢同位素分离全回流模式研究

夏修龙, 王和义, 罗阳明, 任兴碧, 傅中华, 刘云怒, 刘俊, 古梅, 谢波, 翁葵平

中国工程物理研究院 核物理与化学研究所, 四川 绵阳 621900

收稿日期 2006-12-6 修回日期 2007-4-16 网络版发布日期: 2008-4-20

摘要 为探求全回流模式下低温精馏氢同位素分离过程中有关操作参数的内在联系, 研究了再沸器加热功率对脱氘率、床层压降、液氢液位等的影响。当再沸器加热功率从5 W增加到12.4 W时, 脱氘率从88%增加到99.6%, 脱氘率与再沸器加热功率基本呈线性关系。随再沸器加热功率的增加, 液氢液位下降, 床层压降增加, 但在该功率范围内未出现液泛现象。随加热功率增加, 精馏柱操作压力从100 kPa升高到190 kPa, 冷凝器和冷头为提供更多冷量而温度降低。

关键词 [氢同位素分离](#) [低温精馏](#) [全回流](#)

分类号 [0643.14](#)

Hydrogen Isotopes Separation by Cryogenic Distillation Under Total Reflux Mode

XIA Xiu-long, WANG He-yi, LUO Yang-ming, REN Xing-bi, FU Zhong-hua, LIU Yun-nu, LIU Jun, GU Mei, XIE Bo, WENG Kui-ping

China Academy of Engineering Physics, P. O. Box 919-214, Mi anyang 621900, Chi na

Abstract In order to uncover the inherent relationship of operating parameters in cryogenic distillation separation of hydrogen isotopes, the influences of W_r (heat power of reboiler) on deuterium extraction efficiency, column pressure drop and liquid level were studied under total reflux mode. As W_r increases from 5 W to 12.4 W, the deuterium extraction efficiency increases almost linearly from 88% to 99.6%. Under total reflux mode, the pressure drop along column increases while the liquid level decreases with W_r , no flooding phenomenon occurs. With the increase of W_r , operating pressure of distillation column increases from 100 kPa to 190 kPa, temperature of condenser decreases in order to supply enough cold power.

Key words [hydrogen isotopes separation](#) [cryogenic distillation](#) [total reflux mode](#)

DOI

通讯作者

扩展功能

本文信息

▶ [Supporting info](#)

▶ [\[PDF全文\]\(487KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“氢同位素分离”的相关文章](#)

▶ 本文作者相关文章

- [夏修龙](#)
- [王和义](#)
- [罗阳明](#)
- [任兴碧](#)
- [傅中华](#)
- [刘云怒](#)
- [刘俊](#)
- [古梅](#)
- [谢波](#)
- [翁葵平](#)