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研究报告

电解-精馏级联分离H_2/HD过程的理论分析

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摘要 为研究电解精馏级联氢同位素分离过程的规律性，建立了理论模型，并以H2/HD为对象计算研究了系统分离行为。同时获得了电解和精馏过程系统的浓集行为：电解池中HDO浓度从2.88×10-4 增长到 8.35×10-4，精馏柱再沸器中HD浓度达到0.033。随时间的增长，脱氘率下降，在精馏柱上HD浓度整体抬升。进一步研究了回流比对脱氘率的影响，回流比在3-7之间，平均脱氘率从0.9828 到0.9973。

关键词 氢同位素分离 低温精馏 电解

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A theoretical analysis of H2/HD separation performance by electrolysis-distillation process

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Abstract A theoretical model was constitued to study the separation of hydrogen isotopes by electrolysis-distillation process, and separation performance of H2/HD was investigated. Enrichment behavior of both electrolysis and distillation was obtained:HDO concentration in electrolysis increased from 2.88×10-4 to 8.35×10-4,HD concentration in reboiler finally reached 0.033. However,as enrichment develped,deuterium extraction efficiency decreased with time and HD concentration along distillation column increased simutaneously.The reflux ratio’s effect on deuterium extraction efficiency was also studied,deuterium extraction efficiency was between 0.9828 and 0.9973 with reflux ratio between 3 and 7.

Key words hydrogen isotopes separation cryogenic distillation electrolysis

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