

## 联合电解催化交换系统HD/H<sub>2</sub>O和HT/H<sub>2</sub>O体系模拟

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**摘要** 计入蒸汽的影响, 研究建立基于两步传质的联合电解催化交换系统模型, 计算HD/H<sub>2</sub>O 和HT/H<sub>2</sub>O两个体系的分离性能。传质系数的提高能显著改善交换系统的整体性能, 电解池浓缩倍数与电解池滞液量有关。电解池中氘浓度的增长最终将引起交换系统脱氘率的下降, 这一现象表明, 在交换系统操作模式选择以及与后级浓缩系统的级联匹配中, 对交换系统的动态行为必须予以特别关注, 并应在交换床设计中考虑此因素。

**关键词** [氢同位素](#) [联合电解催化交换](#) [氘](#)

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## Simulation of Combined Electrolysis Catalytic Exchange With HD/H<sub>2</sub>O and HT/H<sub>2</sub>O Systems

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**Abstract** Based on two-step isotope exchange process, a theoretical model incorporating vapour effect for combined electrolysis catalytic exchange (CECE) system was constituted. The separation performance of HD/H<sub>2</sub>O and HT/H<sub>2</sub>O systems was calculated by using this model. The increase of mass transfer coefficient can notably improve exchange system's performance. The deuterium enrichment in electrolysis cell will finally cause a poor deuterium extraction efficiency, and this conflict indicates that dynamic behavior of CECE is a main concern in the choice of operating mode and the connection with cascade post-enrichment system, and it should be an important factor in designing catalytic exchange column.

**Key words** [hydrogen isotopes](#) [combined electrolysis catalytic exchange](#) [tritium](#)

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