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水-氢同位素液相催化交换工艺研究

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摘要 以PtSDB为憎水催化剂研究了水氢同位素液相催化交换工艺,讨论了反应温度、氢气流量、低浓重水流量等工艺条件对催化交换塔传质单元高度(HTU)的影响和反应温度、气液比对催化交换塔阻力降的影响。结果表明:当反应温度为60℃、气液比为1:1时,水氢同位素液相催化交换工艺是比较适宜的。

关键词 [憎水催化剂](#) [水氢交换](#) [氢同位素](#) [传质单元高度](#)

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Study on Liquid Catalytic Isotopic Exchange of H₂O-H₂

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Abstract The process conditions are experimentally studied for H₂O-H₂ liquid catalytic isotopic exchange with Pt-SDB as hydrophobic catalyst. The results show that the pressure drop of the catalytic exchange bed is caused mainly by temperature and hydrogen flow rate. The efficiency of catalytic exchange reaction is high with a packing ratio of 1:4 of hydrophobic catalyst and hydrophilic packing. The height of a mass transfer unit (HTU) decreases with increasing temperature, but the trend is slow down when the temperature is above 60 °C. The HTU increases with increasing the mole rate of hydrogen flow and the diluted heavy water flow.

Key words [hydrophobic catalyst](#) [water and hydrogen exchange](#) [hydrogen isotopes](#) [height of a mass transfer unit](#)

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