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化学

钯钇合金膜分离器的氕氘分离系数测定

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摘要 文章设计钯钇合金膜氢同位素分离器，并系统研究分离系数与温度、分流比、气体流速等因素间的关系。研究结果表明：分离系数随温度的增加而下降，在573～723 K范围内，对于66.2%H2-33.8%D_2气体，当进料流速为5 L/min、分流比为0.1时，分离系数由2.09下降至1.85；而当分流比为0.2时，分离系数由1.74下降至1.52。随着分流比的增大，分离系数逐渐降低。在573 K下，进料流量为5 L/min时，对于15.0%H2-85.0%D_2，当分流比由0.050增大至0.534时，分离系数由2.43降低至1.35；对于66.2%H2-33.8%D_2，当分流比由0.050上升至0.688时，分离系数由2.87下降至1.30。对于一定的分离过程，原料气体流速存在最佳值，达到该值时，分离系数最大。

关键词 分离系数 钯合金膜 氢同位素分离

分类号 TG146.41

H-D Separation Factor Measurement by Palladium Alloy Membrane Separator

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Abstract A palladium alloy membrane separator was designed to further develop its separation performance between H_2 and D_2. The separation factor of the single stage was affected by the temperature, the feed gas component, the split ratio and the gas flow rate, etc. The H_2-D_2 separation factor decreases with the increasing of temperature and decreases with the increasing of split ratio. In the range of 573～723 K, when the feed rate was 5 L/min, the separation factor of 66.2%H_2 -33.8%D_2 decreases from 2.09 to 1.85 when the split ratio was 0.1 and from 1.74 to 1.52 when the split ratio was 0.2. At 573 K and the feed rate of 5 L/min, the separation factor of 15.0%H_2-85.0%D_2 decreases from 2.43 to 1.35 with the increasing of split ratio from 0.050 to 0.534， and for 66.2%H2-33.8%D_2, the separation factor decreases from 2.87 to 1.30 with the increasing of split ratio from 0.050 to 0.688. When the separation factor is the biggest, the flow rate of feed gas is in a perfect value. To gain a best separation performance， perfect flow rate, lower temperature and reflux ratio should be chosen.

Key words separation factor palladium alloy membrane hydrogen isotope separation

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