

## RESEARCH NOTES

新型惰性膜反应器中丁烷氧化脱氢制丁二烯和丁烯

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**摘要** The oxidative dehydrogenation of butane to butadiene and butene was studied using a conventional fixed-bed reactor (FBR), inert membrane reactor (IMR) and mixed inert membrane reactor (MIMR). When IMR and MIMR were employed, a ceramic membrane modified by partially coating with glaze was used to distribute oxygen to a fixed-bed of 24-V-Mg-O catalyst. The oxygen partial pressure in the catalyst bed could be decreased. The effect of feeding modes and operation conditions were investigated. The selectivity of C4 dehydrogenation products (butene and butadiene) was found to be higher in IMR than in FBR. The feeding mode with 20% of air mixing with butane in MIMR was found to be more efficient than the feeding mode with all air permeating through ceramic membrane. The MIMR gave the most smooth temperature profile along the bed.

**关键词** [butane](#) [ceramic membrane](#) [oxidative dehydrogenation](#) [membrane reactor catalyst/V-Mg-O](#)

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### **Oxidative Dehydrogenation of Butane to Butadiene and Butene Using a Novel Inert Membrane Reactor**

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**Abstract** The oxidative dehydrogenation of butane to butadiene and butene was studied using a conventional fixed-bed reactor (FBR), inert membrane reactor (IMR) and mixed inert membrane reactor (MIMR). When IMR and MIMR were employed, a ceramic membrane modified by partially coating with glaze was used to distribute oxygen to a fixed-bed of 24-V-Mg-O catalyst. The oxygen partial pressure in the catalyst bed could be decreased. The effect of feeding modes and operation conditions were investigated. The selectivity of C4 dehydrogenation products (butene and butadiene) was found to be higher in IMR than in FBR. The feeding mode with 20% of air mixing with butane in MIMR was found to be more efficient than the feeding mode with all air permeating through ceramic membrane. The MIMR gave the most smooth temperature profile along the bed.

**Key words** [butane](#); [ceramic membrane](#); [oxidative dehydrogenation](#); [membrane reactor](#); [catalyst/V-Mg-O](#)

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