measurement or to continuously measure the temperature in the catalyst filling direction in a case where there is a temperature distribution in the catalyst layer.

[0029] According to the invention described above, it is possible to produce isobutylene at a sufficient conversion and sufficient selectivity by the dehydration reaction of isobutanol.

EXAMPLES

[0030] Hereinafter, the invention will be described in detail by means of Examples of the invention. However, the invention is not limited to these Examples.

[0031] Analysis of the raw material gas and the product was conducted by gas chromatography. The conversion of isobutanol and the selectivity to isobutylene to be generated are respectively defined as follows.

Conversion (%) of isobutanol = (b/a) × 100

Selectivity (%) to isobutylene = (c/d) × 100

a = the number of moles of isobutanol supplied

b = the number of moles of isobutanol reacted

c = the number of moles of isobutylene generated

d = the total number of moles of reaction product (isobutylene, isobutane, 1-butene, cis-2-butene, and trans-2-butene) detected by gas chromatography

[0032] In addition, the hourly space velocity (WHSV) of isobutanol per unit time is defined as follows.

WHSV of isobutanol (1/hr) = e/f

e = the supplied amount of isobutanol per unit time (g/hr)

f = the mass of catalyst used (g)

[0033] The BET specific surface area calculated from N_2 adsorption/desorption

results are presented in Table 4.

[0056] [Example 9]

The reaction and the measurement were conducted in the same manner as in Example 1, except that 0.2508 g of the catalyst B was used and the flow rates of isobutanol and the nitrogen gas were changed to 0.270 ml/min and 0 ml (standard)/min, respectively. The concentration of isobutanol in the raw material gas supplied to the catalyst layer was 100% by volume. The reaction conditions and the measurement results are presented in Table 4.

[0057] The relation between the concentration of isobutanol in the raw material gas and the selectivity to isobutylene based on the above Examples 4 and 6 to 9 is illustrated in Fig. 3.

[0058] [Example 10]

The reaction and the measurement were conducted in the same manner as in Example 5, except that 20.79 g of the molded body (cylindrical pellet shape (diameter: 3.0 mm) of the catalyst B was used and the flow rates of isobutanol and the nitrogen gas were changed to 0.965 mL/min and 101 mL (standard state)/min, respectively. The concentration of isobutanol in the raw material gas supplied to the catalyst layer was 70.0% by volume. The reaction conditions and the measurement results are presented in Table 5.

[0059] [Examples 11 to 18]

The reaction and the measurement were conducted in the same manner as in Example 5, except that 2.904 g of the molded body (cylindrical pellet shape (diameter: 3.0 mm) of the catalyst B was used and the flow rates of isobutanol and the nitrogen gas were changed to 0.487 mL/min and 50 mL (standard state)/min, respectively. The concentration of isobutanol in the raw material gas supplied to the catalyst layer was

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