

ABSTRACT

Provided is a method for producing an unsaturated aldehyde including subjecting an alkene to partial oxidation using a fixed bed multi-tube reactor to produce the corresponding unsaturated aldehyde, in which catalyst layers formed by being divided by n (n is 2 or more) in a gas flow direction in a reaction tube are provided, when a filling length of the catalyst layers from a first catalyst layer to an $(n-1)$ th catalyst layer from a gas inlet side of the reaction tube is L , and a filling length of an n th catalyst layer from the gas inlet side of the reaction tube is L_n , a relationship between L and L_n satisfies the following equation (1):

$$1 < L/L_n \leq 3 \quad (1), \text{ and}$$

a composition of a catalytically active component contained in the catalyst layers from the first catalyst layer to the $(n-1)$ th layer from the gas inlet side of the reaction tube is different from a composition of a catalytically active component contained in the n th catalyst layer from the gas inlet side of the reaction tube.