

Abstract

The present invention provides a method for preparing methyl formate and coproducing dimethyl ether. A raw material containing formaldehyde and methanol is introduced into a First Reaction Region contacting with a Catalyst A to react, and the post-reaction material is separated to obtain Constituent I. The Constituent I is introduced into a Second Reaction Region contacting with a Catalyst B to react, and the post-reaction material separating is separated to obtain methyl formate, dimethyl ether and Constituent II. At least 1% of dimethyl ether is taken as product, and the rest of dimethyl ether is recycled to the First Reaction Region. The Constituent II is recycled to the Second Reaction Region. In the raw material, the molar ratio range of formaldehyde to methanol is from 1:4 to 1:0.05, and the molar of formaldehyde and methanol are calculated according to the molar of carbon atoms contained in formaldehyde and methanol, respectively. The weight hourly space velocity of formaldehyde in the raw material ranges from 0.01 h^{-1} to 15.0 h^{-1} . The reaction temperature of the First Reaction Region ranges from $50 \text{ }^{\circ}\text{C}$ to $100 \text{ }^{\circ}\text{C}$. The reaction temperature range of the Second Reaction Region is from $50 \text{ }^{\circ}\text{C}$ to $200 \text{ }^{\circ}\text{C}$, and the reaction pressure range is from 0.1 MPa to 10 MPa. Each component is gaseous phase and/or liquid phase, independently. The method shows benefits, including a long catalyst life, a mild reaction condition, a high utilization ratio of raw materials, an achievement of continuous production and an application potential of large scale industrial.