

Abstract of the disclosure

A method for producing methanol including a synthesis step and a separation step, wherein the method includes: a synthesis loop including at least two of the synthesis steps and at least two of the separation steps, a raw material gas mixing step of obtaining a make-up gas by mixing a hydrogen rich gas obtained from a hydrogen recovery unit to which at least part of unreacted gas separated from a final reaction mixture in a final separation step is supplied with a raw material gas comprising at least hydrogen and carbon dioxide and having M value ($M \text{ value} = [H_2]/([2CO] + [3CO_2])$) being 1 or less in the synthesis loop, a distribution ratio controlling step of controlling a distribution ratio of the make-up gas, supplying more than 0 mol % and 100 mol % or less of the make-up gas to a first mixing step in accordance with the distribution ratio, and supplying 0 mol % or more and less than 100 mol % of the make-up gas to a final mixing step, the first mixing step of obtaining a first mixed gas by mixing the make-up gas distributed from the distribution ratio controlling step with a residual gas obtained by removing a part of gas from the final unreacted gas, a first synthesis step of synthesizing the methanol from the first mixed gas, a first separation step of separating the first unreacted gas from the first reaction mixture obtained in the first synthesis step, the final mixing step of obtaining a final mixed gas by finally mixing the unreacted gas with the make-up gas distributed from the distribution ratio controlling step, the final synthesis step of synthesizing the methanol from the final mixed gas, and the final separation step of separating the final unreacted gas from the final reaction mixture obtained in the final synthesis steps.