

A process for the production of dimethyl ether from gaseous mixtures of carbon monoxide, hydrogen and methyl acetate contaminant comprising contacting a gaseous mixture of carbon monoxide, hydrogen and methyl acetate contaminant in a first scrubbing zone with a first portion of methanol to recover a scrubbed gaseous mixture depleted in methyl acetate and a first used methanol stream containing methyl acetate; contacting the scrubbed gaseous mixture in a second scrubbing zone with a second portion of methanol to recover a scrubbed gaseous mixture further depleted in methyl acetate and a second used methanol stream containing no methyl acetate or a reduced amount of methyl acetate compared to the first used methanol stream; dehydrating at least a portion of the second used methanol stream in the presence of at least one catalyst to produce a crude dehydration reaction product comprising dimethyl ether, unconverted methanol and water; recovering from the crude dehydration product a water stream comprising mainly water and 3 mol % or less acetic acid and a dimethyl ether stream.