addition of liquid AC, the MMP reaction enthalpy of the MMP reaction into 2 zones. However, the process is likewise not described for the use of AC-containing gases.

It is therefore an object of the present disclosure, in a minimum number of process steps, to prepare MMP of maximum purity and maximum yield, based on the amounts of AC and MC used, from AC-containing gas without separate water condensation and from crude MC (MC > 87% by weight, dimethyl sulphide 1.5–5% by weight, dimethyl disulphide 0.2–1% by weight, dimethyl ether 0–3% by weight, water ~0-2% by weight and methanol ~0-2% by weight).

This object is achieved by a process for preparing methylmercaptopropionaldehyde from gaseous acrolein and methyl mercaptan, characterized in that, in one process step, simultaneously, (a) gaseous acrolein is absorbed from a mixture at least comprising one compound from the group consisting of the hemithioacetal of methylmercaptopropion-aldehyde, methylmercaptopropionaldehyde and methyl mercaptan, (b) in this mixture, acrolein is reacted with methyl mercaptan and/or the hemithioacetal of methylmercapto-propionaldehyde to give methylmercaptopropionaldehyde and (c) impurities and by-products are removed from this mixture. In the reaction of acrolein with methyl mercaptan and/or hemithioacetal, it can be assumed that hemithioacetal does not react directly with acrolein but first decomposes to acrolein and methyl mercaptan (equilibrium) and the methyl mercaptan thus released then reacts with acrolein to give MMP.

In an aspect, there is provided a process for preparing methylmercaptopropionaldehyde from gaseous acrolein and methyl mercaptan, characterized in that, in one process step, simultaneously,

(a) gaseous acrolein is absorbed from a mixture at least comprising one compound from the group consisting of the hemithioacetal of methylmercaptopropionaldehyde, methylmercaptopropionaldehyde and methyl mercaptan,

(b) in this mixture, acrolein is reacted with methyl mercaptan and/or the hemithioacetal of methylmercaptopropionaldehyde in a liquid phase to give methylmercaptopropionaldehyde and

(c) impurities and by-products are removed from this mixture,

wherein the process step is performed in a reactive absorber in a temperature range of 20-50 °C and the methyl mercaptan used contains 1.5-5% by weight of dimethyl sulphide and 0-3% by weight of dimethyl ether, characterized in that the ratio between methyl mercaptan

and acrolein in the mixture is adjusted to a value between 0.95 and 1.01 mol/mol, characterized in that the mixture comprises the hemithioacetal of methylmercaptopropionaldehyde, formed by addition of methyl mercaptan onto methylmercaptopropionaldehyde in a concentration between 1 and 10% by weight and in that the impurities and by-products are removed from the mixture by stripping at 0.3 to 5 bara, and, at 5 to 70°C.

In an advantageous embodiment, the process step is performed in a reactive absorber. The reactive absorber is characterized in that, in only one vessel or in only one stage, gaseous AC is absorbed in a mixture of principally MMP, MC and hemithioacetal, AC reacts directly or via the hemithioacetal intermediate with MC to give MMP, and low-boiling secondary components (including dimethyl sulphide, acetaldehyde, water and dimethyl disulphide) are stripped, with minimization of the offgas losses of reactants and target product.

In an advantageous embodiment, the impurities removed comprise at least one compound from the group consisting of dimethyl sulphide, acetaldehyde, water, dimethyl disulphide, methanol, carbon dioxide, propane, propene, hydrogen sulphide and dimethyl ether.

It is unnecessary to remove water from the product in order to achieve MMP yields based on the AC used close to 100%. In a preferred embodiment, water is not removed additionally from the methylmercaptopropionaldehyde obtained.